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Cable Address.....Autoland, Philadelphia
Telephone.....Sherwood 1424

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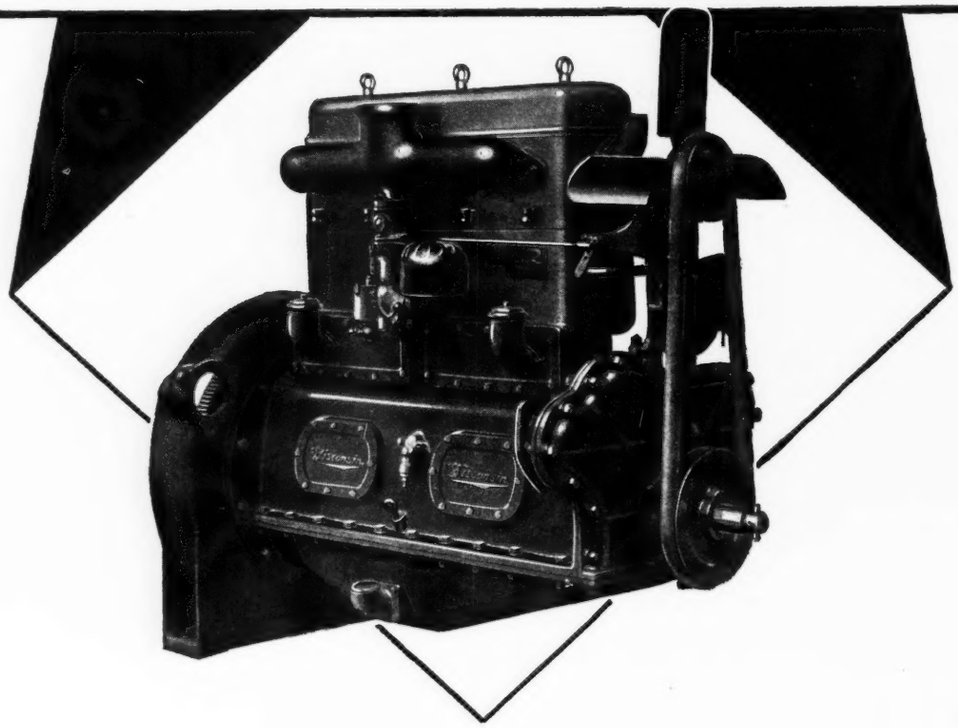

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AUTOMOTIVE INDUSTRIES

VOLUME 59 *Philadelphia, Saturday, October 13, 1928* NUMBER 15

Safety Experts *Center* Attention *on* Automobile Accidents

Believe broadest field for progress lies in reduction of motor vehicle casualties. Mishaps generally due to faulty driving. Cars are structurally safe.

THE safety experts of the country, as represented by the National Safety Council, which held its annual convention last week in New York, are generally convinced that the broadest field for progress lies in the reduction of motor vehicle accidents, which have proved less susceptible to control than those arising through the hazards of industry.

But although there was much concern expressed over the rising curve of highway accidents involving motor vehicles, there was no disposition to place any part of the responsibility on the automotive industry. It is more and more realized that motor vehicles are structurally safe, and one speaker went so far as to say that the driver almost without exception was the cause of injuries and fatalities.

The current conception, as brought out at the sessions of the council, of how the motor vehicle problem should be attacked, follows three main lines:

1. Uniformity of regulation is needed, and it is hoped that this will be provided by adoption of the new Model Municipal Traffic Code.

2. Better reporting of accidents is needed so that causes may be better understood. A plan looking to this end was adopted.

3. Earnest work by local organizations attacking problems peculiar to the area is essential.

Safety work in the automotive factories has been thoroughly organized in recent years, but development is still under way, and the latest ideas were aired at the meetings of the automotive section of the council. One of the interesting points brought out was the manner in which efforts to eliminate accidents in material handling had brought about gains in efficiency aside from the direct saving involved in fewer accidents.

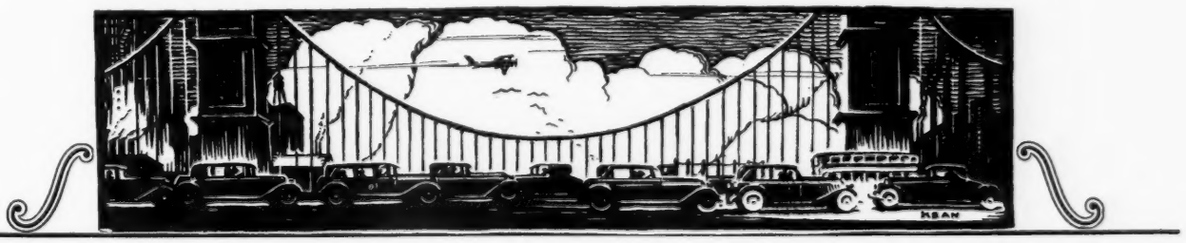
Safety in aeronautics was treated at length by the leading authorities. Although structural failures in aircraft are now rare, the accidents resulting from these causes are usually fatal, receive widespread publicity, and do more than any others to undermine public confidence, it was pointed out, and therefore should be eliminated so far as is humanly possible. Pilot qualifications and training, and airports were also considered in relation to the safety question.

The congress opened Monday with a members' meeting in the Hotel Pennsylvania. After greetings by local officials and a special word of welcome by Alfred H. Swayne, vice-president of General Motors Corp., and chairman of the congress committee, Homer E. Niesz, president of the National Safety Council, delivered his annual address.

Decrease in Industrial Accidents

In this address he pointed out the general decrease of industrial accidents since the growth of the safety movement and outlined the need for increased activity in the prevention of home accidents which today constitute one of the largest groups.

While the motor vehicle accidents constitute the only group which have not been completely tabulated for 1927, such figures as are available indicate that 1927 had a poorer record than the preceding year. In cities, however, where local safety committees are organized



and actively at work, Mr. Niesz indicated that these accidents did show a decrease during 1927.

Mr. Niesz also commended the work that had been done during the past year in the adoption of a model traffic ordinance for general use throughout the country and indicated that a further study was to be made of traffic signs.

The Tuesday morning session of the Public Safety Division was devoted to a discussion of how to find the real facts of accidents. Considerable discussion was aroused during this meeting on the question as to determination of probable causes from accident reports.

Human Carelessness Blamed

H. C. Burnham, research director of the Motor Vehicle Division of Rhode Island, presented a paper in which he indicated that report forms, including the proper questions and analyzed by an individual who is conversant with traffic situations and who had a thorough knowledge of human nature, would show the actual causes for all accidents. These causes, he concluded, were in every case due to human error. His contention was that an analysis of any accident would show that human carelessness had entered in some form or other into the situation and that by educating the public along these lines they could be taught to avoid the particular forms of error which result in fatalities or other serious accident.

Considerable discussion was aroused by his contention, many of the safety engineers present feeling that an attempt to lay the blame for an accident on an individual in no way solved the problem of preventing future accidents.

Leon Aronowitz, statistician for the New York Bureau of Motor Vehicles, discussed the organization of a state or city accident statistics bureau. He indicated that the first requirement was registration, with suitable penalties, requiring participants in accidents to make a regular report. This registration should then be kept constantly before the eyes of the people so that they would always remember to report any accidents in which they participated.

A. H. Swayne
Vice-president, General Motors Corp., spoke at the opening session of the Safety Congress

Report forms of accidents should be simple so that drivers would not be confused by the questions asked in these reports. Other sources of statistical information employed by Mr. Aronowitz include newspaper clipping bureaus and the department of health and vital statistics. Local police forces and city safety committees also furnish much information to the statistical department.

At the afternoon session of the Public Safety Division on Tuesday, Deputy Police Commissioner Philip D. Hoyt of New York City told how accident statistics, as compiled on the streets of New York, had been used to lower the death rate. He pointed out that in 1927 New York had a rate of deaths from automobile accidents of 17.8 to every 100,000 population, as compared with over 19 for the country as a whole and with something over 20 for other urban communities.

From statistical information gathered concerning accidents, spot maps are drawn, recommendations for traffic lights or traffic officers are made and as a result of the knowledge obtained as to causes traffic officers are trained to remove all causes possible. This information is also made available for safety committees and through coordinating with the public school system is used in educating the police as to proper care in traffic.

Dr. Louis I. Dublin, statistician of the Metropolitan Life Insurance Co. and chairman of the Statistics Committee of the National Safety Council, spoke on accident problems as revealed by statistics. He painted rather a dark picture of the traffic situation and pointed out that one out of every four accidental deaths was due to the automobile, and that the total figures for accidental deaths during 1927 showed an increase over 1926 because of the automobile.

The National Safety Council, according to Dr. Dublin, is organizing a registration area for the gathering of complete accident statistics, which includes 100 cities in seven states with a population of 50,000,000 persons. This registration area is employing a uniform report system, drawn up by the council, and it is the hope that eventually federal officers will take over the securing of accident data on a uniform basis for the whole country.

Following Dr. Dublin's address, the division voted to approve the recommendation of the council for the organization of a statistics section of the Public Safety Division of the National Safety Council.

J. H. Juhl, superintendent of planning, Chrysler Corp., told the automotive section how a competitive plan for the material handling department brought about an enormous reduction in accidents and remarkable gains in efficiency. A committee of production and safety engineers hold monthly inspections covering such points as how clean the shop is kept; whether parts and materials are piled carefully and not above the maximum height set for certain items; how well the aisles are kept clear and damaged and obsolete equipment removed, and how fast the electric trucks travel.

Small Containers Safer

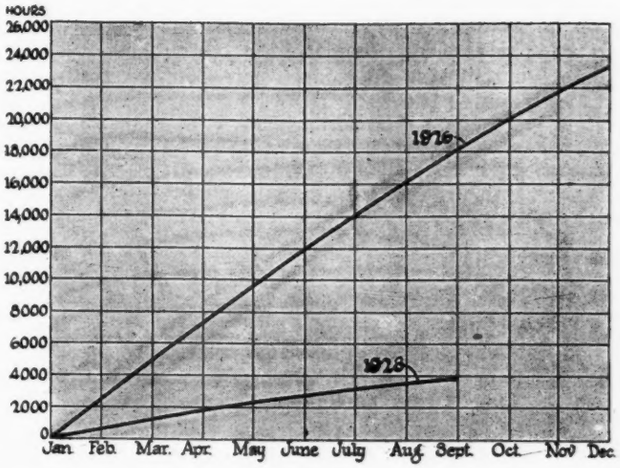
It was found that if certain parts and materials were shipped in smaller containers storing would be facilitated and risks of accident reduced. Traffic signals for the trucks were installed at the main aisle intersections. The competition served to enlist the hearty cooperation of foremen and the monthly inspection—made on different days, without warning—besides serving as a check on observance of the rules, gave much valuable information on inventories and condition of stocks.

Whereas in 1926 there were 23,486 hours lost through accidents in the department, in the 1928 period to Sept-1 the loss was only 3807 hours, and five of the months were entirely free of accidents.

Hazards in the application of pyroxylin lacquer were considered by E. G. Richardson, Berry Bros.; H. L. Miner, E. I. duPont de Nemours & Co.; and R. E. Abbott, Fisher Body Corp. It was generally agreed that the fire hazard could be almost eliminated by proper ventilation and the careful disposal of residue after each day's work. If dry cleaning was resorted to, care should be taken that metal-to-metal contacts which might cause sparks be avoided.

E. H. Cotcher, superintendent of safety, Murray

Corp. of America, described the contest plan employed by his company to good effect. Departments of the various plants are rated according to the hazards of the operations and sums established against which costs of outside medical attention to workers as the result of accidents, or lost time in excess of a week, are charged. If these expenses run below the established figure in the period set, the foreman profits, and a ratio of comparison of results in different departments is fixed.



In the material-handling department of the Chrysler Corp., 23,486 man-hours were lost through accidents in 1926. Improved methods, described by J. H. Juhl at the safety congress, greatly reduced the loss, the total for the first nine months of 1928 being only 3807 hours

Under this plan minor injuries are not charged against the departments as the policy, it is felt would discourage first aid attention to minor injuries and increase the cases of infection. In the discussion this feature was warmly approved.

Some comment was made to the effect that the workers themselves sometimes felt resentful that they did not share in the rewards for care in the prevention of accidents, and this brought out a description of the plan in the Willys-Morrow plant at Elmira, N. Y., whereby workmen in departments showing good safety records were given useful prizes which could be bought by the company at low costs because of the large quantities involved.

Mr. Cotcher was named as the new head of the automotive section, with H. L. Sain, Frigidaire Corp., vice-chairman; and H. L. Fracher, Detroit Steel Products Co., secretary. H. A. Reninger was made president of the council and William E. Metzger, of Detroit, was one of the new directors elected.

The final session of the automotive section brought out a discussion of rehabilitation. Fisher Body Corp. turns major cases where rehabilitation is required over to the state bureau in charge of such matters, but has a separate department in which light work is done and where men who have had maiming accidents are trained in useful operations.

In the discussion of mechanical guards, it was urged that the men on the machines be given an opportunity to suggest safety measures and devices, as this contributed to their acceptance of the means adopted.

Aviation Sessions

The Aviation Division opened its sessions Thursday morning under the joint auspices of the Safety Council and the Daniel Guggenheim Fund for the Promotion of Aeronautics. The morning session of the Aircraft Division, under the chairmanship of Prof. Alexander Klemin of the Daniel Guggenheim School of Aeronautics of New York University, discussed the relation of structures and materials to safety in aviation. Ted Wright, chief engineer of the Curtiss Airplane & Motor Co., pointed out that while only 8 per cent of aircraft accidents were attributable to structural failure, 6 per cent were largely of a fatal nature and affected the public reaction toward aviation to a larger extent than other types of accidents. He described in considerable detail work whch is being done in stress analyses of every part that goes into the making of a plane before the plane is made so that its structural integrity can be told to a definite degree beforehand. He pointed out that in stress analyses for airplane structure the load factor or ratio between stresses involved in maneuvering as compared with normal stress was of primary importance.

In the manufacture of planes, structural tests of all parts, inspection tests, drop tests, propeller whirl tests and sand load tests were all made as static tests during the construction.

Another phase which Mr. Wright emphasized was that changed aerodynamic qualities of airplane construction frequently involved changes in stress on various parts and that constant care was necessary in reanalyzing these.

At this same session, Wesley L. Smith, superintendent of the Eastern Division of the National Air Transport, Inc., gave a very illuminating talk on structural reliability from the operator's point of view, in which he told the engineers present of a number of structural weaknesses which he had encountered in operation.

Aero-dynamic Features

During the afternoon Professor Klemin undertook a consideration of the aero-dynamic features of safety in aircraft construction. He intimated that some lift increasing device seemed to be the next probable step in aircraft development. By this means a lower landing speed, with a shorter landing run would be made available, as well as a shorter take-off being required. A finer gliding angle should also be developed but at the same time it should be possible to make a very steep glide where it is necessary to bring a plane down in a small area surrounded by obstacles.

Thomas Carroll, chief test pilot of the National Advisory Committee for Aeronautics at Langley Field, spoke on the desirable flying characteristics of an airplane from a safety point of view. These characteristics, he pointed out, depended largely upon the use for which the airplane is designed. In the case of a private owner's plane certain characteristics of stability are exceedingly desirable, whereas in the commercial plane, operated by a skilled pilot in all kinds of weather, stability must be sacrificed to a certain extent to controllability. In the first case, where controllability or the response of the plane to the controls is highly developed, there might be a tendency on the part of the operator toward overcontrol and, consequently, less safety, whereas in the latter case controllability in the hands of a skilled pilot is of paramount importance. The feature of visibility, maneuverability and the comfort of the pilot were also brought out by Mr. Carroll as features tending toward greater safety.

H. C. Dickinson, chief of the Heat and Power Division, Bureau of Standards, addressed the powerplant

section of the Aircraft Division on Friday morning on laboratory and service tests of engine safety. He enumerated five points which were chief contributing factors to accidents caused by powerplant failure: Mechanical or structural defects in the engine; failure of fuel supply; failure of ignition; failure of the lubricating system, and failure of the cooling system. Of these, failure of the fuel supply and ignition are the most prolific of accident, with mechanical or structural defect coming second.

Secondary Causes

Secondary causes of these accidents, due to a personal aspect, are carburetor control, control of engine speed—where pilots drive their own planes at top speed or above rated power—and carelessness in the choice of fuels.

Mr. Dickinson outlined the procedure of laboratory tests which are carried out to determine the operating characteristics of a given motor, its structural safety and reliability and any faults in design. After these are carried out service tests are given, but these, he pointed out, while equally important in the determination of the reliability of the motor, lack the accuracy and detail of the laboratory tests.

Following Dr. Dickinson, Charles L. Lawrence, president of the Wright Aeronautical Corp., spoke on the safety requirements of an aircraft engine and its installation. He pointed out that the engine for successful aircraft use must be made to meet conditions far from the ideal. Careless mechanics will not oil all parts as they should be oiled and pilots may not use the correct grade of gasoline or oil. These are factors which enter into the operation of an aircraft motor which make it necessary to construct these motors with a high factor of safety. Engines must be designed, he said, so that they will stand overloading, so that ice will not form in the carburetor under any conditions and so that all accessories will be easily accessible for maintenance purposes. Some of the features which he regards as necessary for a good aircraft motor are oil cleaners, protection of ignition wires, multiple valve springs, dual ignition and some method of preventing broken valves from falling into cylinders.

Following Mr. Lawrence's address, a paper prepared by Capt. L. M. Woolson, aeronautical engineer for the Packard Motor Car Co., was read dealing with the field service and maintenance of aircraft engines. This paper covered primarily the points which can be learned by the motor producer from actual operation of the motor. These points include the ready accessibility of parts for service, the uniformity of fastenings for assembly parts whereby a minimum kit of tools is required for repair work, and other features which make maintenance service as easily accomplished as possible.

Among several papers of particular interest at the session of the Taxicab and Fleet Owners Section of the council there was a detailed discussion of safety rules for bus operation by R. W. Meade, president, the Peoples Motorbus Co., St. Louis, and a plea for education of the small operator and owner of a few trucks by Henry J. Mineur of the J. M. Horton Ice Cream Co., Inc., who said that the large fleet owners generally recognized the need for a firm policy to insure safe operation.

Acetylene as Motor Fuel

RESULTS of experimental work on the use of acetylene as motor fuel are given by Prof. R. Lutz, of Trondhjem, Norway, in *Der Motorwagen* of Sept. 10. The work seems to have been initiated during the war, when gasoline was very scarce in Norway, whereas, owing to the cheapness of water power, calcium carbide, the raw material from which acetylene gas is obtained, could be produced in the country at relatively low cost. Similar conditions obtained in Switzerland, and there, too, experiments with acetylene as motor fuel were made during the war and for some time thereafter.

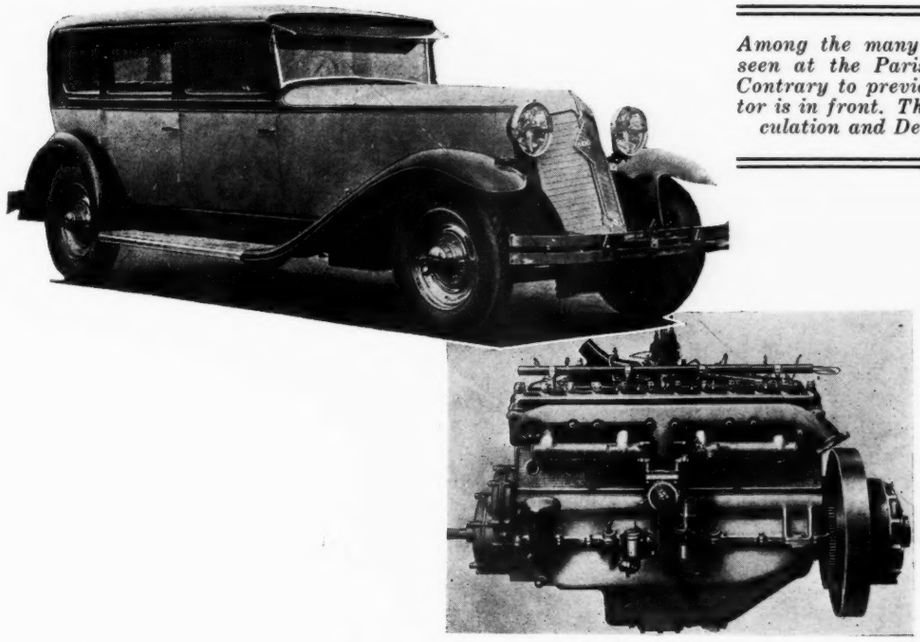
It has long been known that acetylene is a highly detonating fuel, and it has generally been assumed that this made it undesirable for use on motor vehicles. Prof. Lutz points out that when the mixture of acetylene and air is too lean, there is trouble from back-firing, which is due to the same cause as back-firing through the carburetor with gasoline, such lean mixtures being very slow-burning. When the mixture is too rich there is trouble from detonation. The theoretically correct mixture which gives complete combustion of the acetylene without excess of air is 11.9 volumes of air to 1 of acetylene. However, in order to prevent trouble from detonation it is necessary to work with much leaner mixtures, so that there is at all times a considerable excess of air. According to Haber the limiting proportions of useable mixtures are 19 volumes of air to one of acetylene and 32 volumes of air to one of acetylene. If water is injected into the cylinders the mixture can be further enriched up to the theoretical proportion of 11.9 volumes of air to one of acetylene.

Suitable for Automobiles

Summarizing the results of his investigations, Prof. Lutz states that they unquestionably prove that, looked at from a purely technical standpoint, the operation of automobile engines on acetylene is highly satisfactory and that acetylene is well adapted to replace gasoline. Any ordinary automobile engine can be operated on acetylene without material changes, and the only objectionable feature is that the maximum output is somewhat reduced. There is not the least difficulty in starting the engine; it runs as regularly as clockwork, responds quickly to wide variations in demand, and operates with very clean combustion. All of these good properties were verified by the Laboratory in long trials, during which the best operating conditions were ascertained. All apprehension with respect to danger of explosion and the unpleasant odor of the motor fuel was found to be baseless, as these difficulties can be overcome.

The above good opinion of the acetylene engine, which is based exclusively on laboratory tests, must be somewhat modified if a generator suitable for use in an automobile is included in the subject under consideration. The latter might, under certain conditions, unfavorably affect the otherwise high degree of reliability, and also might be objectionable on account of its odor; but these difficulties, too, would probably be capable of solution.

The subject assumes an entirely different aspect when the economic results of the tests are considered. As pointed out, the experiments were started in the first place to meet an emergency, and, besides, the price of calcium carbide in comparison with that of gasoline, was not then unfavorable. Since that time the price situation has changed greatly in favor of gasoline, which is now used exclusively in Norway. When it is further considered that in the case of acetylene the operating costs are added to by interest, depreciation and maintenance charges on a special generator, the conclusion cannot be avoided that acetylene cannot possibly compete with gasoline under present conditions.



Among the many new European straight-eights seen at the Paris show is this Renault model. Contrary to previous Renault practice, the radiator is in front. The engine, with pump water circulation and Delco ignition, is pictured below

U. S. Representation at *Paris Show* Largest in History

30 American passenger car builders exhibit products. Sixes and straight-eights numerous in European displays.

By W. F. Bradley

Special Cable to Automotive Industries

PASSENGER cars are being exhibited at the 1928 Paris Automobile Show by 66 French manufacturers, 30 American, 7 Italian, 5 German, 2 British, 1 Austrian and 1 Czechoslovakian. The American participation is the largest in history and American interest is further accentuated by the presence of a large number of factory executives and export managers. The attendance is greater than at any previous show, a special feature being the presence of large numbers of dealers and buyers from all countries of Europe.

The show opened on Thursday, Oct. 4, with 1200 exhibitors occupying 237,000 sq. ft. of floor space and exhibiting products estimated to be worth $4,000,000.

This show, which closes Oct. 14, is confined to passenger cars and accessories, and it will be followed at a short interval by a motor truck and motorcycle show.

The outstanding feature of the show is the immense number of six-cylinder engines and 20 European makes of straight-eights. American competition in Europe is largely responsible for the move toward eights. Most of the latter have only a medium piston displacement, some being as low as 130 cu. in., and they are designed more with flexibility than high speed in view. Among the new eights are Mercedes-Benz, Renault, Horch, Unic, De Dion, Bianchi, Amilcar, Praga and Panhard-Levassor. For the first time sixes outnumber fours among European makes, and several Continental manufacturers have dropped or are preparing to drop four-cylinder types.

Citroen introduced his new six, which, with a metal sedan body, sells at 32,600 francs ($1,280). Production plans call for 300 cars of this model per day, in addition to a four-cylinder model of the same general lines which is also to be produced at the rate of 300 per day.

Renault's feature is a big straight-eight with a radiator in front. This is evidently intended to take the place of the present six. His big production jobs, however, are two sixes selling at 26,500 and 36,800 francs ($1,045 and $1,450, respectively), with sedan bodies. Fiat is almost entirely on a six-cylinder program, with three new models. Rosengart introduced a small three-passenger job having the same general lines as the English Austin.

Many changes in design have been made to adapt cars to American production methods, but there are comparatively few mechanical novelties. Independently-sprung wheels and duplicate steering show no progress. The only new front-wheel drive is the Chaigneau-Brasier in a straight-eight chassis. The situation with respect to automatic transmissions is unchanged. Sensaud de Lavaud is showing a one-piece cast chassis with

a conventional transmission, a special differential, duplicate steering and independently sprung front wheels, but is offering an automatic transmission as optional equipment.

Body styles are showing greater variety, closed bodies predominating. Brighter colors are also much in evidence. Fabric leather bodies are holding their position but are being disguised to resemble metal construction.

Durant has just opened a sales office with the biggest frontage on the Champs Elysees. It was reported that he had acquired an interest in the Amilcar company with the intention of marketing the Amilcar in America and building Durants in France. Amilcar is producing a small sporting type of car.

Another Merger Announced

A merger between Chenard-Walcker, Delahaye, Unic, Donnet and Rosengart is also announced, but it is believed that this will be merely an understanding covering purchases, design and sales, and will leave the companies independent financially.

Alvan Macaulay, president, Packard Motor Car Co., called a private conference with leading European manufacturers on Sunday, Oct. 7, to discuss plans for international cooperation.

The six-cylinder model just introduced by Citroen is one of the cheapest cars of its class in Europe and is expected to come into direct competition with American machines on foreign markets. This is the first six to be built by Citroen and it constitutes the greatest change in the firm's engineering policy since 1919.

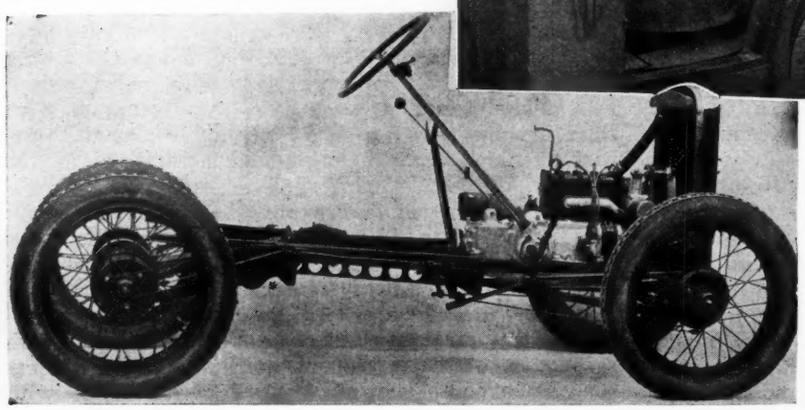
With a bore and stroke of 72 by 100 mm., the engine has a piston displacement of 149 cu. in. It is an L-head type, with cylinders and crankcase in one casting, a detachable head, pressed steel oil sump, battery ignition with a Delco distributor and the firm's own electric generator. The electric starting motor is a separate organ. The crankshaft is carried in four bronze-backed white metaled bearings. The camshaft is driven by a double roller chain; the water pump is in the forward end of the cylinder head and is driven by belt from the crankshaft. The layout of the pipes allows of a flow by thermo-syphon if the pump is not operating. Lubrication is under pressure to the main and the connecting rod bearings, with the oil passing through a Tecalemit purifier. Split-skirt aluminum pistons are fitted.

The intake and the exhaust manifolds are united to form a hot spot for the mixture, which is supplied through a Solex carburetor fed from a 12-gal. tank at the rear. There is a 2-gal. feed tank on the dashboard carrying the vacuum apparatus within it. In case of a breakdown of the vacuum system, it is possible to run by gravity from the auxiliary tank, and the large capacity of this latter makes it practically impossible to stall the engine for lack of fuel on mountain passes. The engine is stated to develop 45 hp., and the car speed is 5 to 65 m.p.h. on high. A clean appearance is given to the engine by the fitting of a Bakelite cover on the cylinder head, thus hiding plugs, wiring and distributor. Attachment to the frame is by four points with rubber blocks interposed.

The single-plate clutch and the three-speed transmission form a unit with the engine. On all models built in the past the driveshaft has had fabric universal joints. The new six has metal joints, and the shaft passes through one of the frame cross-members, for the side rails are very thin and have a height of 7.8 in. The rear axle has undergone little change. It carries spiral bevel gears and a one-piece malleable-iron differential housing with two satellities.

The front axle is of I-section between the spring pads and circular section outside them. The steering pivots are mounted with ball thrust bearings and the front wheel brake operating mechanism is all mounted on the axle itself, independently of the chassis. Connection is made by steel cables. The friction type shock absorbers, attached to the frame member, have their arm attached to an eye on the axle very close to the steering knuckles, this mounting, it is claimed, being very effective in eliminating wheel wobble. Front springs are shackled at the front to the tubular cross-member and pivoted at the rear. Rear springs are also shackled to a tubular frame member. The brakes are applied through a vacuum servo built by Citroen under Westinghouse license. Wheel track is normally 53 in., but the standard

Above — Rosengart convertible cabriolet which is built to sell in France for $600. Left —Rosengart closed model with seats for three. The third seat is set across the body

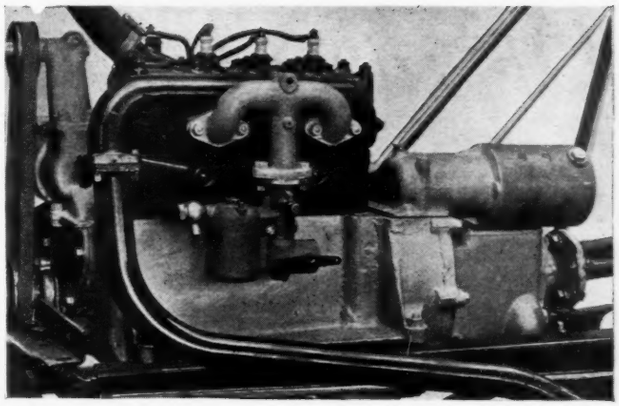


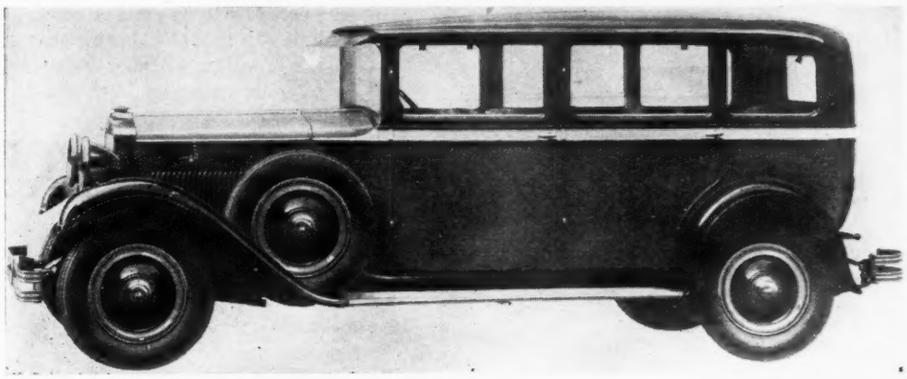
Below—Chassis of the new 7 hp. Rosengart which made its appearance at the show as the lowest-priced car in France

track of 56 in. is supplied for the export market.

A reduction 2¼ in. in total height, without any loss of internal height in the closed bodies has been obtained by fitting the bodies around instead of on the frame members. The seats are carried directly on the frame members, there are no body cross-members, and the running boards and the fenders are fixed directly to the frame members, without the use of valences between body and running board. The bodies are all-metal, produced in a Budd-equipped plant. They are pyroxylin painted in bright colors, with the fenders in black enamel. External metal parts are chromium plated.

For the present year the four-cylinder model which has been in production about three years will be replaced by a new type having the same general features as the six, with an engine of the same bore and stroke.





Above—Rosengart 7 hp. engine is built on the same lines as the English Austin. Left—Fiat Model 521, a new six of 72 by 103 mm. L-head engine

The "four" differs from the six in having its gasoline tank on the cowl, instead of at the rear, but in all other respects the two are similar. It is produced in both open and closed body styles, while up to the present the six has been cataloged with closed bodies only.

In adding a straight-eight to his line, Renault has abandoned his thermo-syphon and rear radiator fetich in favor of pump water circulation and a radiator in front. In doing this, however, he has adhered so closely to his original type of hood that if the car is seen in profile it is not immediately noticeable that any change has been made.

Hand-Operated Shutters

The radiator is V-section and inclined rearwards. Hand operated shutters are mounted on it, and it is surrounded by a cowl which follows the lines of the front portion of the original Renault radiator. In order to complete these lines, the water filler is mounted on the rear of the water outlet collector on the cylinder head, and the top of this filler pipe is connected by a copper tube to the top of the radiator. The design considerably reduces the overall height of the chassis compared with previous models.

With a bore and stroke of 90 by 140 mm. (piston displacement 434 cu. in.) the Renahuit, as it is officially designated, is an L-head type with a detachable head held down by 30 studs, a five-bearing crankshaft, aluminum alloy pistons, and timing gear at the front. The electric generator and the water pump are in tandem on the right-hand side of the engine. Immediately behind the pump is the electric starting motor engaging with a ring gear ahead of the fan-type flywheel. There is no radiator fan, but the flywheel is made efficient for removing fumes and hot air from the engine by the aluminum dashboard fitting very close to it.

On the left-hand side of the engine is a dual carburetor with a single float chamber, one carburetor feeding the four central and the other the end cylinders. The exhaust manifold heats the central portion of the intake manifold, and the exhaust pipe is carried down at the rear between the aluminum dashboard and the aluminum floor boards into an expansion chamber and then into a muffler.

The magneto has been discarded on this, as well as on all other Renault passenger car models, in favor of battery ignition with a Delco distributor. The distributor is mounted on the cylinder head and is driven from a vertical shaft between the fourth and fifth cylinders, this shaft also driving the oil pump. An oil radiator is incorporated in the lubricating system, and use is also made of a centrifugal oil purifier.

Chassis features resemble those of other Renault models. The transmission is on the front end of the torque tube, and provides four speeds ahead and reverse. A friction-type servo mechanism is built into the transmission housing. Springs are semi-elliptics in front, with the shackles at the forward end, and a transverse spring, supplemented by a pair of diagonally mounted cantilevers, at the rear. The wheel track has been increased to 59½ in., to allow of wide bodies being fitted, and wheelbase is 147 in.

FLIGHT tests of a super-charged air-cooled engine were made recently at Langley Field, the machine used being a U.O.-1 two-seater biplane with Wright Whirlwind engine, Model J-4. A Roots blower was fitted and was mechanically driven. Sea level pressure was maintained at the carburetor inlet up to an altitude of 18,500 ft. Thermo-couples registered the temperature of the cylinder head and the highest temperature recorded, 498 deg. Fahr., was attained at an altitude slightly greater than that corresponding to maximum engine power. The theoretical ceiling was increased from 19,400 to 32,600 ft., and the time required for attaining an altitude of 16,000 ft. was reduced from 32 to 16 minutes. These tests, which are of a preliminary nature only, are dealt with in N.A.C.A. Report No. 283, by M. Ware and O. W. Schey.

Automotive Industries
October 13, 1928

Objective Thinking Viewed as Key Business Management

Executive who gives himself over completely to task at hand, striving only for success of organization as a whole and without thought of self-aggrandizement, will build stronger structure than is possible by subjective principles.

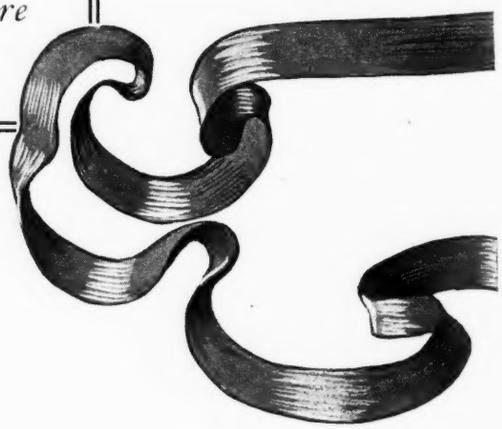
THE discovery and practice of the principles of scientific management, if these principles can be found and identified, is the problem which today occupies the executive mind. What I have here undertaken is the statement of this problem in its very broadest terms—as broad as life itself.

There can be no principle of management which is not involved in the words *Subject* and *Object*, for these two words sum up the totality of our existence. As in philosophy it is the Object that principally matters, so in the practical affairs of life the objective must always be our main concern. It must be evident to every serious mind that our relations as Subjects to the universal Object, in other words to everything outside of ourselves, is one of strict dependency. We cannot will, or think, or feel, or act, except in terms of the Object, with which we are in unceasing contact. It is the one and only constant determining factor of every life.

So much for the relation of Subject and Object, expressed in terms of Being, or existence. When we come to psychology we find in every person two distinct trends, the subjective and the objective, and in the relative predominance of the one over the other, whichever it may be, we shall find with unerring certainty the character of the individual man, and his attitude toward every external problem. Here also we shall find that, contrary to the true relation, the Object is usually subordinated to the Subject.

The average man is predominantly a subjectivist. We find greater pleasure in the assertion of our own egos than in the subordination of this ego to the objective realities. The extreme subjectivist is not even interested in these realities, save as he can utilize them for his own subjective ends. Independent subjectivism is the one absolute impossibility, yet the existence of such a concept proves what some of us would like to be.

For these reasons the subjective trend has always dominated human thought; it is evident in nearly every concept; it reveals itself even in the systems of our philosophers, whose interpretations of life, with its whole content of truth, are too often only the projected images of their own subjectivism. Nor is this trend peculiar to Western thought. The Oriental is steeped in it, in even greater measure. I once started to read a



book on the philosophies of India by a distinguished Hindu Yogi, but was floored on the first page of the introduction by the statement that no Occidental can hope to understand the Hindu philosophy unless he cultivates the Hindu cast of mind. What has cast of mind got to do with the eternal objective verities? And what is it that obscures our understanding of these verities if it is not the subjective trend for which "cast of mind" is only another name?

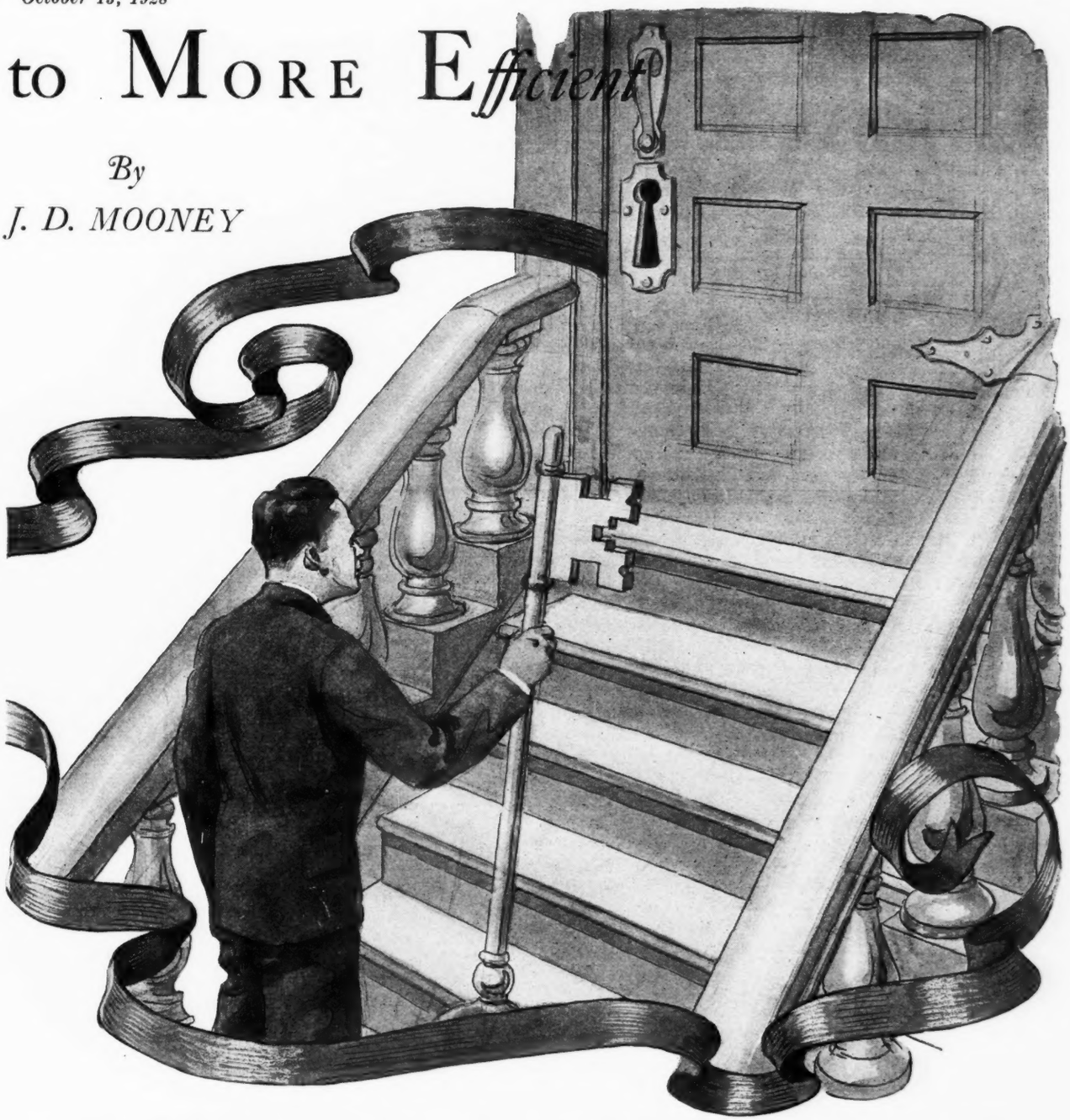
Subjectivists in History

As it is in the realm of thought, so it must be in the realm of action. Subjectivism in ideas, even at its extreme, hardly affords a parallel to subjectivism in acts and deeds. And it is exactly this kind of subjective management, in state and nation, in every human relation, that our world has experienced for countless ages. We cannot prove this by any review of business history, for business, in its modern organization, has no historical forbears. The trend reveals itself, however, in the careers of countless rulers, generals and statesmen, each of whom is an executive and manager in his own sphere.

The subjectivist can indeed, if he is what is known as a "strong character," impress on those who are subject to his management the stamp of his own personality. But, we are justified in asking, wherein lies the advantage, unless the exploitation of this same personality is the main idea? Unfortunately this, too often, *is* the main idea, which every specific aim and purpose is compelled to serve. Such creations of subjective man-

to More Efficient

By
J. D. MOONEY



agement can at best be no greater than their creator, and are bound to be subject to all his defects.

An outstanding historical example of subjectivism, and how it reveals itself in practical operation, is afforded by the career of Napoleon Bonaparte. The great empire built by the Corsican was the projected image of himself, the complete expression of his genius, but with the defects inherent in any creation which is dominated by the subjective factor. Like every extreme subjectivist, Napoleon finally became enslaved and mastered by the arrogance of his own conceit. It destroyed his sense of relative values, it blinded him to the fact that there were some things that even Napoleon could not do. That he would ultimately attempt the impossible, and ruin himself in the undertaking, was something that any keen student of the psychology of extreme subjectivism might have foretold.

If we search for some historical antithesis, which will illustrate on the same grand scale the operation of the objective factor, we shall not find it, at least not in any purely secular human activities. The reason is obvious. In whatever we will, think or do, the subjective motive always seems bound to enter. But, relatively speaking, the objective examples are numerous. We may find them in the careers of our own Washington and Lincoln, for these men labored for causes in which their own egos were subordinated to the great objective aim and purpose.

The Composite Type

Midway between these subjective and objective examples we find the composite type, of which Cromwell was an outstanding illustration. How are we to place a man whose service and devotion to an objective aim translated itself in the end into a near-Napoleonic self-assertion? The answer is with the great mass of humanity, for each one of us, be his sphere wide or limited, illustrates these subjective and objective contradictions of our composite human character.

It is of deepest significance that we must go to re-

ligion if we are to find those human activities in which the objective motive is most completely in the ascendent. Here also we witness the institutional results of objectivism in the great, organized religious communions of the world, which seem to possess and in fact do possess a character of stability and permanence far greater than any other form of human association. It is natural that the adherents of religious creeds should find in this fact a justification for their faith. This faith, however, is simply another illustration of the objective factor. There is no objectivism comparable to that of the religious devotee.

Business Napoleons

Let us now take these two trends of human motives and consider them concretely in their application to the great field of modern organization and management. The Napoleons that we hear about nowadays are those of business and finance. The term is trite, so very trite that few of us who use it consider its deeper significance. To the average man, a "Napoleon" of anything is simply some outstanding figure in any field of human effort.

But in the strictest subjectivistic sense there are Napoleons of modern business. Many great business enterprises today are the creations and the elongated shadows of some one dominating personality. That a large number of these have been and are enormously successful may be granted. No man could project his own shadow in this fashion if he were not a genius, and it is in the nature of genius to achieve. Nor does it follow that such creations of subjective management always carry within themselves the seeds of impermanence. We must never forget that in human life everything is relative. If the attainment of the absolutely objective viewpoint is impossible, it is equally impossible to divorce one's self completely from the objective realities. Even the lunatic, who is the most complete of all subjectivists, cannot do this. In everything we do in life the outward facts are forcing us and compelling us. The psychological difference between the objectivist and the subjectivist is that the former searches for all the compelling realities, the latter makes selective search only for those realities which harmonize with his own ego or which seem to suit his present purpose. Other facts he accepts only when he must.

Executive as an Architect

In considering the true ideals of objective management, let us conceive the executive as a builder or an architect. There is a sense in which the creations of the architect must always express his individuality, yet the architect who deliberately and consciously sought such expression would be false to the principles of his art. His problem is the application of beauty and symmetry of form to practical needs, and he knows that beauty of form has its objective principles which transcend all subjectivism. The conscientious architect strives for perfection in his every creation, and, even though he be philosophically untrained, he knows through artistic instinct that perfection is objective in its essence. The subjective is conditioned always by the Relative; it is only the Objective that is conditioned by the Absolute.

Now I can hear someone ask the question: "Are you attempting to set up perfection as your standard of management?" To this I answer, "As an aim and object—*certainly.*" That such perfection, is, humanly speaking, unattainable, is beside the question. Our attainments in any field must be in relation to our objects. We cannot expect even a relative approach to perfection unless we make absolute perfection the goal of our conscious aim and efforts.

There are several unfailing tests of real objectivism in management. One of these is the mental attitude in which the executive approaches his problem. Another is how he organizes himself for his task. And the final one is how, in the pursuit of these objects, he chooses and organizes the personnel that surrounds him.

The objectivist in management must, to begin with, sink himself in his objective. It is only thus that he can hope to see his problem through to its finality, and organize each program and policy to fit this final aim. He must also see his problem in its completeness. This sounds obvious but it touches the commonest weakness of the subjectivist. The latter may often think himself objective, but his subjectivism betrays itself in the objects toward which he directs his interests, which are always those which make the strongest subjective appeal. The real objectivist allows himself no such indulgence. He knows that the soundness of his judgment depends on the adequate consideration of all the objective factors, and to this end he never fails to look every fact in the face.

Thinking and Planning Machine

In the organization of his plans and personnel he proceeds with the same single purpose—always with sole reference to the object and its attainment. Objective management demands not only the complete organization of the plan but the most complete adaptability of the human element to fit the plan. You may call the objective manager, and the organization which he creates, a machine if you will, for such in a sense it must be, but it is a thinking and planning machine, which knows its objective, and works to this end, consistently and unceasingly.

The criticism may here be made that the objective idea in management, which subordinates personalities to aims and purposes, is destructive of individuality—that it makes of each human a mere cog in the machine.

Those who voice this objection have failed utterly to understand the real character and significance of objectivism as applied to managerial problems.

In the first place the expression "destruction of personality" is a contradiction in terms. A man's personality, or individuality if you prefer that term, is simply the totality of his psychic complex, and as such it is his one and only inalienable possession. This complex may be modified or conditioned by a thousand influences, but it cannot be destroyed by anything short of the destruction of the man himself. Only the complete psychological determinist, in other words the behaviorist, would deny that individuality is the inalienable and always dominating human factor.

What management can do, and often does, is not to destroy personality but to suppress its outward expression. But who is the real suppressor of personality, the objectivist or the subjectivist? The true subjectivist is interested in the assertion of no personality but his own. There is no more jealous god, none more intolerant of other gods, than the god of subjectivism.

The objectivist in management, on the other hand, has this decisive advantage, that he does not think primarily in terms of personality at all—either of his own or of those about him. His principal thought is ever on the task—the goal, immediate or ultimate, of his aim and purpose. But in the process of his thought, the adoption of means to ends, personality becomes a highly important factor. If his first thought is ever

of the task, his second thought must always be of the men to fit the task. Thus, paradox as it may seem, the objectivist in management becomes the real exalter of personality. The very fact that his thought is always objective gives him the correct focus.

When his ideal of management is attained, the net result becomes like that of a symphony orchestra. Here we have perfect collective harmony both in process and results, but this collective harmony would be impossible if every member of this orchestra were not trained to the limit of his personal capacity. What is true of the orchestra as a whole, thus becomes true of each one of its individual members. Every musician in such an ensemble becomes a true objectivist; he sees and appraises his own efforts only in their relation to the collective result.

The question now calls for answer, is there any great business institution today which has attained the symphonic harmony in aim and purpose which is the true goal of objective management? If the ideal is the symphony orchestra, truth compels an answer in the negative. It is the merest truism that every human being is more or less dominated by his own ego; it is this psychological condition which makes him human; and every worthy effort toward the objective ideal in management must reckon with this fact. Nevertheless the growth of the objective element in management is unmistakable, mainly because of the accumulating evidence that it insures a better balanced efficiency. The very fact of the present-day emphasis on organization is evidence of this growth, for organization, even of the military brand, implies some definite objective. It is evident, however, that the highest efficiency in management is not to be obtained through mere organization. Above all it is essential that such organizations should be dominated, throughout their entire personnel, with the true objective idea, and this trend also is clearly evident in some of our greatest business institutions. I am profoundly convinced that it is only through the application of these principles that we may hope to advance to new and higher standards of scientific management.

Federal Heavy-Duty Truck Capable of High Road Speed

AS stated in the news section of last week's issue, announcement has been made by the Federal Motor Truck Co. of a new 3-3½-ton truck of high performance characteristics, powered with the recently developed six-cylinder Continental valve-in-head engine. While the new truck, the Model 306, is capable of road speeds as high as 40 m.p.h. and better, it is not really a high-speed truck in the sense in which that term is usually understood, for it is of heavy-duty design throughout, with high safety factors. High performance is due in the main to the unusually high engine output, 84 hp. at 2200 r.p.m. (the governed speed), but it is also contributed to by the use of a seven-speed transmission (of Brown-Lipe make). Such high performance naturally calls for great braking power, and this is provided by a Westinghouse vacuum servo which operates the Timken rear wheel internal brakes, the servo being actuated by the usual pedal. This service brake is supplemented by a hand-operated emergency brake located on the rear end of the propeller shaft, this location of the service brake being an established Federal practice.

The engine was described in *Automotive Industries* of May 19, 1928.

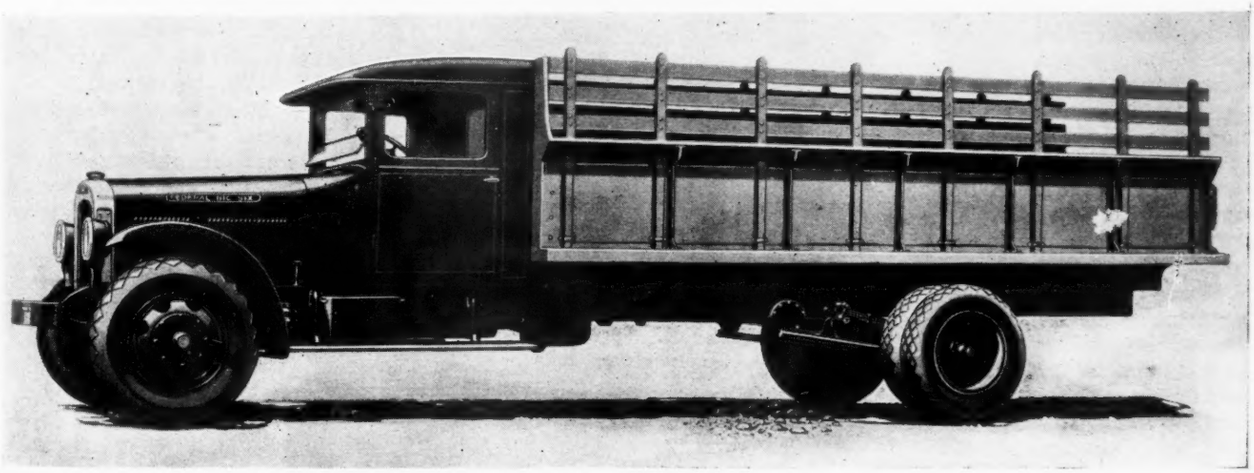
A single-plate 13-in. Borg & Beck clutch is inclosed in the bell housing. The transmission, as usual, is mounted amidships. It is of Brown-Lipe manufacture and has seven forward speeds and two reverse. Bearings are of the tapered roller type. A feature of the transmission is that it can be quickly removed from the chassis.

The rear axle is a Timken heavy-duty worm-drive axle and comes with a standard gear ratio of 6 4/5 to 1, while an option is given on a ratio of 7¾ to 1. The rear axle tread is 33 in.

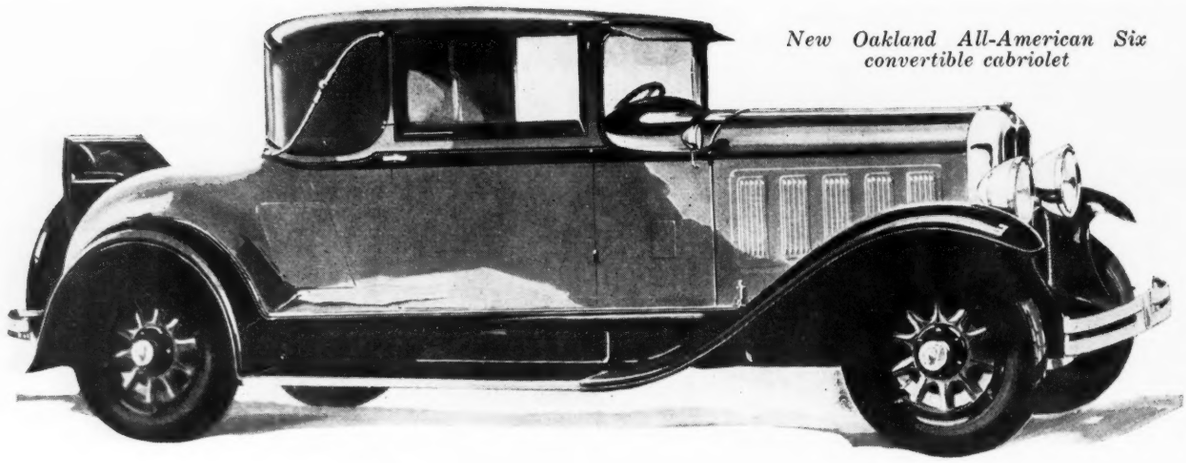
The propelling force is taken on tubular radius rods with ball and socket joints at both ends. Springs are semi-elliptics all around, 42 by 2½ in. at the front and 54 by 3 in. at the rear. At the front the tread is 60 in. Timken roller bearings are used in the front wheels and there are roller thrust bearings on the knuckle pins.

Standard wheel equipment consists of single disk front and double disk rear wheels.

The carburetor is of Zenith manufacture. Delco-Remy electrical units are used and the steering gear is supplied by Gemmer.



New Federal 3-3½ ton truck with stake body



New Oakland All-American Six convertible cabriolet

Refinements *in* Body *and* Chassis Announced by Oakland

New line is improved in both appearance and performance. Engine output increased by larger bore. Steeldraulic brakes fitted. Changes in harmonic balancer.

By A. F. Denham

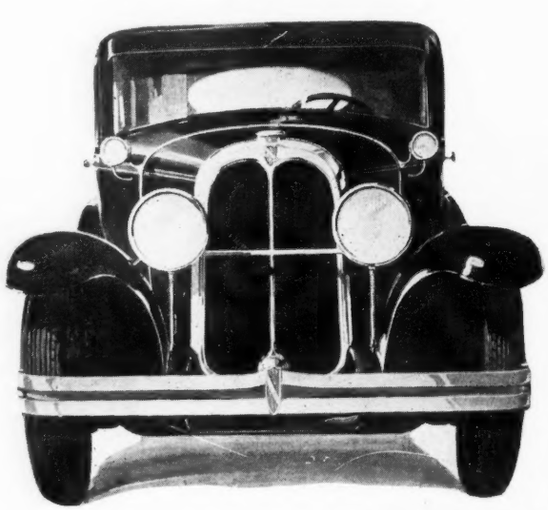
IN the new Oaklands announced this week, individual refinement of various chassis parts to improve all car characteristics, more power, and new bodies are the outstanding features. Prices were not available at the time of going to press but are not expected to differ materially from those of last year.

The harmonic balancer, which formerly was of the coiled spring type, now is made with flat leaf springs, which are easier to control as to tension and also are expected to increase the reliability of the unit.

The new method of casting the cylinder block, using a steel water jacket cover plate to cover core openings, provides better foundry control with respect to thickness of cylinder walls, enables better cleaning after casting, and simplifies the casting operation in general.

"Steeldraulic" internal brakes are fitted.

The bore of the cylinders has been increased 1/8 in. and is now 3 3/8 in., the stroke remaining 4 1/4 in. Various parts and accessories of the engine have been suitably increased in size. For instance, a larger Marvel carburetor (1 1/4 in.) with accelerating pump is now fitted, and the intake manifold, exhaust manifold and muffler are also larger, the exhaust manifold being of 1 3/4 in. diameter. The engine speed-spark advance curve of the automatic spark timing governor has been changed. Pistons are now cast in permanent molds and are lighter than those previously used. The oil pressure relief valve now is of the plunger instead of the ball type, the former being more quiet in action.

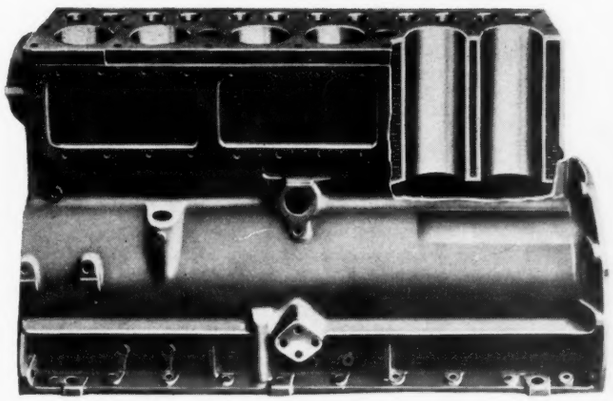


Front view of new Oakland All-American Six

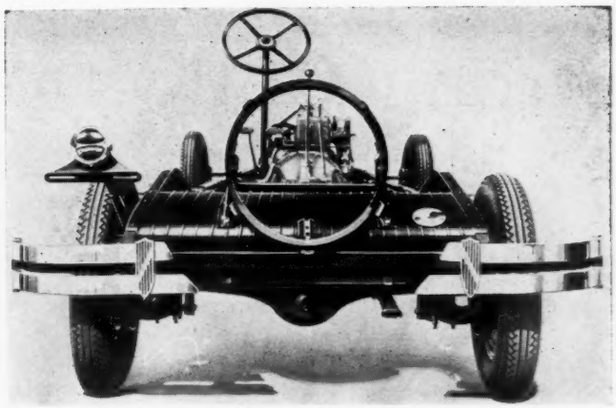
As a result of the increase in the bore the engine gives a higher output, developing 68 hp. at 3000 r.p.m. This power permits of an acceleration of from 10 to 25 m.p.h. in 6 seconds. Four-point engine support is now used, the supports being rubber-cushioned. A sectioned view of the rubber mounting is shown herewith. There is no metal-to-metal contact between engine and frame and the design is such that it is impossible to increase the compression of the rubber by taking up on mounting bolts.

The crankcase is ribbed for increased rigidity. Crankpin bearings are now provided with a cross groove to insure a more copious supply of lubricant to the cylinder walls, and the oil pump has been increased in size. The flywheel ring gear is now made of steel and shrunk on.

The radiator core is made of copper as a better protection against injury from freeze-ups. It is of the hexagon cellular type, as heretofore, but the cells are smaller, which gives increased cooling capacity. A



Oakland cylinder and crankcase block, showing large openings in water jacket and horizontal rib on crankcase

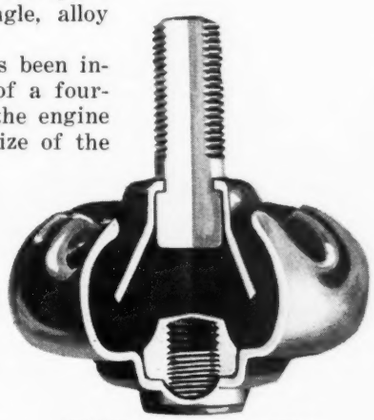


Rear view of the new Oakland. Note the ribbed plate over the fuel tank

false front is fitted as a protection against mechanical injury.

The transmission is secured to the bell housing by means of external bolts, which makes for ease in dismounting and reassembling. To insure better balance, the driveshaft is now made from sheet steel rolled up into a tube, of larger diameter than used formerly. The rear universal shaft is secured to the bevel pinion shaft by means of a four-spline slip joint and a single, alloy steel bolt.

Frame rigidity has been increased by the use of a four-point mounting for the engine and increasing the size of the cross-member under the transmission. Bumper brackets are formed integral with the frame.



Rubber cushioned engine support

In connection with the new Steeldraulic brakes it may be pointed out that the cross-shafts are supported in ball and socket bearings to prevent their binding due to frame weave. Binding of the steering gear is prevented by a side guide for the split nuts. The diameter of the emergency brake drum has been increased to 6½ in. and the hand lever for operating it has been lengthened.

Bodies are of new design and have a new molding treatment. Hood louvres are arranged in five groups of four each. A new colored shield on the radiator shell, bumpers, hub caps, instrument board and mats adds to the distinctiveness of the cars. The radiator is of greater height and has a false front of chevron design, and a chrome-plated vertical center bar. Chromium plating is used for all of the exterior hardware. Steel running boards are now used and the fenders are in one piece and wider. There is a ribbed cover over the fuel tank. Instruments are individually but symmetrically mounted on the instrument panel.

The new Oakland instrument board. Note absence of any effort to group instruments in panels

All bodies are wider at both the front and rear seats, and in closed models the front seats are adjustable. Better ventilation is made possible by kick-type side ventilators. The steering wheel is larger than formerly, and the emergency brake lever is bent forward so as to be less of a hindrance in entering and leaving the driver's seat.

Equipment continues much the same as formerly. Bumpers, six wire wheels, fender wells and trunk racks are offered as added equipment at extra cost. Standard equipment includes Lovejoy shock absorbers, spring covers, air cleaner, fuel pump and strainer, interchangeable gas tank and radiator filler caps, non-glare rear view mirror, automatic windshield wiper, dash gasoline gage, combination tail and stoplight, cowl lights and bands, and semi-coincidental lock, with separate button for ignition switch.

EVAPORATIVE cooling (steam cooling) will be used for the engines of the R-101, one of the two new British airships, and a description of the system was given at the recent meeting of the British Association for the Advancement of Science by Wing Commander Cave-Brown-Cave. The airship will be fitted with heavy oil engines built by Wm. Beardmore & Co. The engine cylinders will be filled with water, but the heat absorbed by the water will be carried away as the latent heat of a comparatively small weight of steam. The water is circulated through the cylinder jackets and is always at the boiling point. Since in the normal water cooling system the heat is carried away to the radiator in the form of sensible heat a very material saving can be effected in the amount of water which must be carried.

Owing to the fact that the steam conveying the waste heat is so light, it is possible to use some of the most effective parts of the outer cover of the airship for heat dissipation and to make the heat-dissipating surfaces themselves of a form which would be quite impossible if water were used as the heat-dissipating medium. The system was first applied to an experimental unit at the Royal Airship Works, and a very similar application was made to the power unit which is undergoing tests prior to installation on the R-101. Various types of aircraft engine have been fitted with this evaporative cooling system and developed full power without modifications in the engine.

Strong Collection *System* Needed in *Selling* Trucks on Time

Far more important in successful handling of instalment deals than work of credit department. Sales manager should be given free hand in developing time sale methods.

By R. G. Paine

FIRST of all, I recognize the value of time sales in our merchandising program. Developing the time sales method will, therefore, be the prerogative of my sales department and the financial department will only control the credit side of the time sales, and even then will be tempered by a considerable amount of sales psychology and sales practice.

In a word then, the sales manager of our factory will look upon time sales as one of his important aids. He will develop time sales throughout his organization, as a definite factor and he will know what he wants and will demand it from the executive heads of his company. By way of contrast, I wonder how many of the automotive plants actually do put the control of time sales in the financial department instead of the sales department.

The real sales manager is going to adhere to the basic thought as to why he wants time sales. He wants them because he needs time selling to help him get his volume. Assuming that over 50 per cent of our future product is going to be sold on time, then over 50 per cent of his sales problem is invested in the subject of time sales and not cash sales or fleet sales. Here is what the sales manager is going to work out:

First, he is going to find out what percentage of the product is being sold on time, in the case of our own company and in the motor truck industry at large. If our percentage is 50 per cent and the industry's percentage is 70 per cent, then there is a 20 per cent increase in business somewhere for our company by building up our time sales to the normal. This does not mean turning cash sales into time sales. It merely means going out after our share of the available time business.

Secondly, perhaps we should have only one price schedule—a time price, and from that give a discount for cash. In other words, let's make our price fit the 70 per cent of our buyers and yet have an attractive discount basis for 30 per cent of our buyers. It is one of the strange peculiarities of the passenger car companies that although possibly two-thirds of the product is sold on time, they have not gone to the time price method with a discount for cash but still quote a price for the minority of their buyers and then have a tremendous sales resistance adding on something as an additional charge against the majority. Judging by actual experience in merchandising motor buses, in that field the better method seems to be to have a time price with a discount for cash, because actual experience so far as independent buyers are concerned has proved this to be a desirable way to present the product and the price.

The third merchandising point which our sales department will develop is the psychology of time sales. Our own field men and our branch managers and our sales force and our distributors and our dealers should all have continuous education in the value of time sales rather than the detriment of time sales. I think we all believe a great deal in psychology. Let us ask ourselves this fair question, "Does our present organization use our time sales plan to reach out for business, or merely to handle such business as may come in and ask for credit?"

We all know that in the past in the motor truck field, time sales were used to a desperate degree to get business, but in getting business the proper way to sell on time was disregarded quite considerably. As a natural reaction from those days, it may well be that we ourselves and our organizations and dealers now have gone to the other extreme because of the unfortunate experiences several years ago.

Boiled down, how to sell properly and safely in order that the real profit in the deal can be realized rests on the following principles:

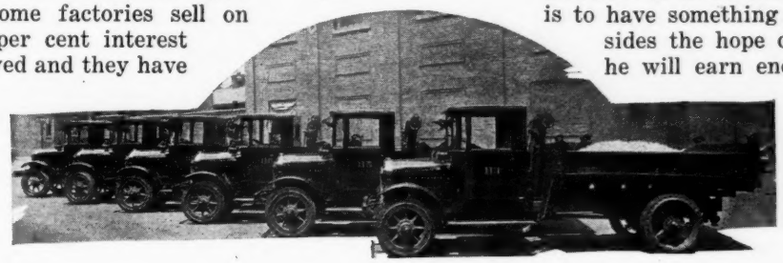
We all realize that our profit in a commodity sold on time is not earned until that commodity has been paid for by the purchaser. Perhaps there is a profit adjustment we should all make in that regard, as I feel sure many manufacturers consider their profit earned when the truck is delivered to the purchaser. I believe we should all feel that the entire profit is not earned until the final liquidation of the purchaser's account. On that account, it is to our best interest to see that we are able to collect from purchasers. Adopting the following safety principles will not curtail our aggressive time sales program.

First of all, whoever is selling time, should collect as a time charge the cost

SPEAKING before the Motor Truck Division of the National Automobile Chamber of Commerce, Oct. 4, Mr. Paine, vice-president of Commercial Investment Trust, Inc., discussed the basic principles of time-selling of trucks. The substance of his remarks is given in the accompanying article.

Mr. Paine, it will be noted, for the purpose of his talk placed himself in the position of a manufacturing executive and made his approach to the problems under discussion from this viewpoint.

of selling on time. Whether it be a dealer who is carrying his own paper, or a factory who is operating through its own plan, or a factory using a finance company, the charge to the customer should be approximately the same. There are instances where some dealers and some factories sell on time at straight 6 per cent interest for the money employed and they have their own time and overhead and their own risk which they are really, therefore, charging against the profit they hope to make in the deal. In my analysis I feel that this is just a question of following the lines of least resistance. In the long run it will be just as easy to charge the fair and reasonable amount for time accommodation as it is now to give straight 6 per cent interest and absorb the additional cost out of the original profit.



THERE are many reasons why fleet sales are extra profitable to the manufacturer or the seller, and yet from the credit standpoint there are many reasons why fleet sales are the most dangerous.

"If the purchaser falls down on his obligation, it may mean 10 trucks repossessed instead of one. It may mean 10 losses instead of one. It may mean destroying the whole used truck price level in a given community.

"One of the credit principles in selling fleets on time, where the fleet amounts to more than two or three units, is to have something behind the paper besides the hope of the purchaser that he will earn enough with the trucks to pay for them."

This leads to a second credit point. In my theoretical position as a manufacturer of motor trucks, I offer the frank statement that I believe we manufacturers need a more uniform price control in our business. Isn't it a fact that our cash delivered prices vary throughout the country according to factors other than the freight? In many instances do not our branches or our dealers quote a price weighted with a special trade-in allowance to offset the inflated trade-in by the other fellow? Except in the very low-price lightweight trucks, is not the price situation rather uncertain? I think we all recognize this because many manufacturers today require a certain amount of down-payment in cash as well as the trade-in. When values are unstable because of this condition, then credits are more hazardous. It would be a wonderful thing I believe if motor truck prices, especially in the heavy-duty field, were established as time prices, not cash prices, but established so that everybody would know what they were supposed to be.

Instability in Terms

This same instability exists in the terms being offered as well as the prices, as I view the situation. If the salesman does not follow the line of least resistance, he will be able to sell the buyer on larger down-payments and quick liquidation of the debt, which will insure more of our profits remaining with us.

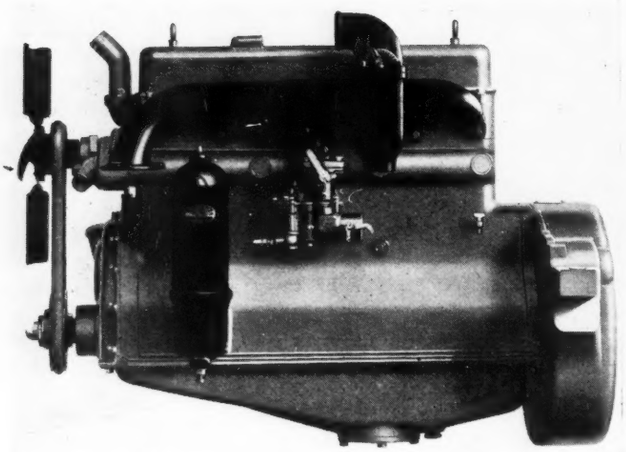
My third suggestion is in reference to fleet sales which credit men and finance men call "jumbo sales." There are many reasons why fleet sales are extra profitable to the manufacturer or the seller, and yet from the credit standpoint there are many reasons why fleet sales are the most dangerous. If the purchaser falls down on his obligation, it may mean 10 trucks repossessed instead of one. It may mean 10 losses instead of one. It may mean destroying the whole used truck price level in a given community. One of the credit principles in selling fleets on time, where the fleet amounts to more than two or three units, is to have something behind the paper besides the hope of the purchaser that he will earn enough with the trucks to pay for them. In many cases, purchasers will supply this additional protection if some constructive credit man talks to them and finds out what their situation really is.

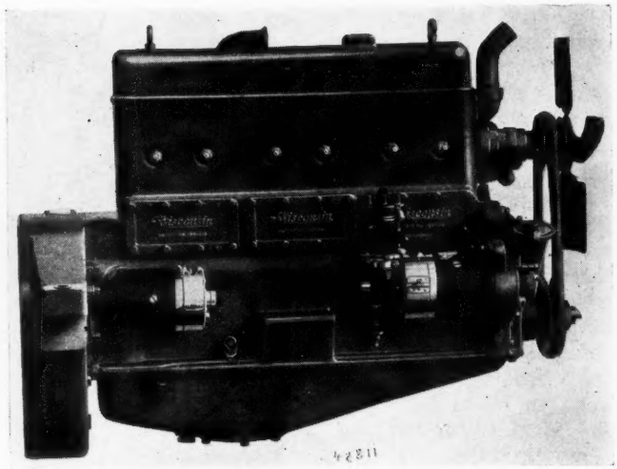
It is because of this peculiar dual situation, that while a fleet is doubly profitable to the seller it is doubly dangerous from his credit standpoint, that I make my final suggestion.

The manufacturer who is selling on time or the dealer or distributor, as the case may be, should have the services of the most constructive credit man that he can obtain. Passing the credits on time sales is not a job to be wished off on some bookkeeper in the office, but it is one of the most important tasks in the organization, as it controls the selling at the same time that it controls the losses. Here again, just as I suggested in the beginning, time sales for the merchandising value should be turned over to the sales department. I suggest that time sales from the credit standpoint be turned over to a real live credit man who has enough of the new business slant to do his job intelligently and in relation to the sales problem.

Most important of all, however, to the collection of the time sale from the purchaser and the safeguard of the profit of the manufacturer or seller, is the creation and maintenance of a strong and experienced collection efficiency.

In my conclusion and in dwelling on this point a moment, I wish to assume my real position as an executive of a leading finance company. The experience of finance companies proves that a strong collection department is 90 per cent of keeping time sales safe. We ourselves have purchased paper created under extraordinarily weak credit positions, but by use of a strong and efficient collection force we have liquidated the paper with a very small loss and at the same time have retained for the dealers the goodwill of their purchasers. This is where experience in collection comes in. As against having the best and most constructive credit man in the world and a weak collection department, I would prefer to have the weakest credit man in existence and the strong collection department. By strong I don't mean strong-armed, but an experienced organization that knows how to sell purchasers on making payments and keeping their commodity in their own hands.





Left—View representative of Models F, N and G Wisconsin engines, showing carburetor side. Right—Model F engine, magneto side

Wisconsin Building New 6-Cylinder Valve-in-Head Engines

Two models for truck and bus service announced. Larger has piston displacement of 309 cu. in. and develops 65 hp. at 2050 r.p.m. Bore of Model N also increased.

By M. Warren Baker

TWO new six-cylinder valve-in-head engines for trucks and buses have just been announced by the Wisconsin Motor Co. of Milwaukee. At the same time the company also announced an increase in the bore of the Model N engine.

The larger of the two new engines is the Model G, which has a bore and stroke of 3⅝ by 5 in., giving a piston displacement of 309 cu. in. and developing an estimated 65 hp. at 2050 r.p.m. Its maximum torque is estimated at 205 lb.-ft. at 575 r.p.m.

Type F, the second of the new engines, has a bore and stroke of 3¼ by 4¼ in., with a piston displacement of 212 cu. in. This engine develops 45 b.hp. at 2000 r.p.m. and its maximum torque is 142 lb.-ft. at 800 r.p.m. Cylinders and crankcase of both models are cast integrally, and the crankcase is heavily ribbed to carry the bearings.

Cylinder heads are cast of close-grained iron, in one piece and carry the valves, rocker shafts and rocker levers. The valves, which are located vertically in the head, have 45-deg. seats and ⅜-in. lift. Exhaust valves are of chrome-silicon steel, while the material of the inlet valves is chrome-nickel steel. The valves of Model G have an outside diameter of 1 11/16 in. and a clear diameter of 1½ in., while those of Model F have outside and clear diameters of 1 15/32 and 1 5/16 in. respectively.

Both engines have timing gear covers of cast iron and these carry the front engine trunnion supports, which are 3¾ in. in diameter. The front trunnion bracket has a drop of 2½ in. and is drilled for two ½-in. bolts, spaced 5⅜-in. from center to center.

No. 3 S.A.E. standard flywheel housings are used; they are made of cast iron and bolted to the rear of the crankcase. Rear engine support arms are drilled for ⅝-in. bolts, 24½ in. from center to center, and the drop from the supporting arm to the center line of the crankshaft is 2½ in.

The crankshaft is carried in four main bearings, 2½ in. in diameter on Model G and 2 in. in diameter on Model F. Bearing lengths on Model G are 2½ in. front, 2¼ in. intermediate, and 3 in. rear; Model F, 2¼ in. front, 1¾ in. intermediate, and 2¾ in. rear. The crankshaft is drop-forged of 45 per cent carbon steel, double heat-treated and is statically and dynamically balanced.

Carbon Steel Connecting Rods

Connecting rods of Model G are made of 35 per cent carbon steel. They have an I-section and are 10½ in. long from center to center, which is slightly more than twice the stroke. The lower bearing is 2½ in. in diameter and 1¾ in. long. Piston pins are 1 1/16 in. in diameter and the 1 7/16-in. bushing is carried in the upper end of the rod. Model F connecting rods are different only in respect to dimensions. They are 8½ in. long, the lower bearing has a diameter of 2 in. and a length of 1½ in.; the piston pin is 1 15/16 in. in diameter and the bushing is 1⅜ in. long.

Cast gray iron pistons are used in the new engines, 4 in. long in Model G and 3¾ in. in Model F. They are fitted with three rings each, ⅛ and 3/16 in. wide in

Models G and F respectively, the lower ring being of the oil regulator type.

Valve tappets are of the mushroom type, detachable in sets of four and mounted on plates bolted to the right side of the crankcase. The camshaft in both engines is mounted in four bearings.

Both main and camshaft bearings are bronze-backed and babbitt-lined. The connecting rod bearings are die-cast in the rod, without spinning. Bronze bushings are used in the upper end of the rod. Timing gears have helical teeth with 1¼-in. and 1-in. faces on Models G and F respectively. Crankshaft and generator gears are of steel, while the timing gear, bolted to the camshaft flange, is supplied either in Formica or Celoron.

Flywheels of both engines have 126 teeth, 8-10 pitch, cut directly in the flywheel rim, for the starting motor. The flywheel is bolted to the crankshaft flange by six ½-in. bolts.

A water pump and fan combination is mounted on the front of the cylinder block and driven by a ¾-in. round belt. The units are supported on a stud, on which they may be swung for adjustment. The fan is 18 in. in diameter, the upper pulley is 4½ in. in diameter, while the lower has a diameter of 6 in. The water inlet pipe has a diameter of 1¼ in. while the water outlet pipe on the cylinder head is 1½ in. in diameter on both models.

Gear Type Oil Pumps

Oil pumps are of the gear type and are driven from the rear end of the camshaft by helical gears. A large removable fine-mesh strainer is attached to the bottom of the pressed steel oil pan, and an oil header extends the full length of the crankcase, connecting with the main bearings. The crankshaft is drilled from main bearings to crank pins, and an oil lead is provided to the hollow overhead rocker shaft and another to the timing gears. Pistons, tappets and camshaft are lubricated by splash.

Oil pressure is carried at 30 to 40 lb. at normal speeds, but an adjustable pressure regulating valve is attached to the outside of the crankcase. The regulating valve also is equipped with a fitting for connection to the dash oil gage. The oil filler is cast on the front gear cover and fitted with a hinged cap. There is a bayonet type oil gage on the right side of the engine, and provision can be made for mounting an oil cleaner.

Exhaust manifolds on both models are made to take an exhaust pipe of 2¼ in. outside diameter, with outlet at the front end of the engine on the left side. A hot air stove with summer and winter regulator is cast integrally with the manifold, and provision is made for mounting an air cleaner on the stove. A hot spot is also provided at the center for the intake manifold. Model G takes a 1½-in. carburetor and Model F a 1-in. A suction type governor is recommended for both models.

A generator with a No. 2 S.A.E. flange may be mounted on the right side of the engine against the rear case. It is driven at 1½ times engine speed, clockwise. The generator is to be provided with a "through" shaft for driving the magneto. The starting motor may be mounted at either side of the flywheel housing by means of a No. 1 S.A.E. flange. It is fitted with an 11-tooth pinion, 8/10 pitch.

A standard magneto base is provided on the right side of the engine, and provision is made for carrying a magneto control rocker shaft through the crankcase. The firing order of both engines is 1-4-2-6-3-5. The timing lever is on the right side (viewed from the driving end). The magneto is driven from the rear of the generator shaft and rotates clockwise. A timer, if used, can be mounted on the generator.

Spark plugs are ⅞ in.—18, with either a ⅞ or 15/16 in. hex and a 1-in. long skirt. They are located on the same side as the magneto.

The Model N engine is now made with a ⅛ in. larger bore (3½ in.), the stroke remaining 4¼ in. Its piston displacement thus has been increased from 228 to 245 cu. in. and brake horsepower from 50 at 2200 r.p.m. to 55 at 2600 r.p.m. The torque reaches a maximum of 163 lb.-ft. at 650 r.p.m.

Grant Talks to Engineers

IF anyone came into my office and asked me, 'What does the public know about engineering?' and I had to give a quick answer, I would say it doesn't know very much. But the public does know the results of engineering and what it says about our goods is what largely determines sales."

This was one of the observations of R. H. Grant, vice-president in charge of sales, Chevrolet Motor Co., in an address at the opening fall meeting of the Detroit Section, Society of Automotive Engineers, on Oct. 2.

Discussing the relation of the automobile and airplane industries, Mr. Grant said, "The automobile is not threatened by the airplane or anything else in the way of a new transportation system. We must have land transportation of an individual character and this the automobile alone furnishes. Rather we should welcome air transportation. If we could add another type of transportation to those we already have it would merely mean more progress for the world."

Mr. Grant also touched on dealer mortality, used car merchandising and other matters of general interest. He said:

"Every year about show time we hear a lot of talk of dealer mortality. To my mind the bulk of this comes from one or two things, either the man in question is a poor business man or he is working for a company which does not understand dealer problems. The man of proper character has more opportunity for a good return on his investment in the automobile industry than in any other industry.

"The greatest blessing we have in the automobile business is the used car market. If this market did not exist we could not sell half of the new cars being sold today." In connection with this questiion Mr. Grant referred to the ever-present desire for the latest style in new cars. He pointed out that the fulfillment of this desire would be considerably handicapped if used cars did not have a good resale value and a fertile market.

At various times it has been suggested that the factories should buy up all the used cars. Regarding this question Mr. Grant said, "Nothing more detrimental could happen to the industry than factory handling of used cars or the consignment of new cars to dealers, as in such a case the dealer would no longer be independent and a great part of his initiative would be removed."

Dealing with the application of engineering principles, such as the development of graphs and formulas, in sales work, Mr. Grant pointed out how this development made possible the overcoming of many detrimental features of automobile selling, including over-stocking and "terrible cleanups" at the end of the season.

New Methods Evolved to Overcome Inaccuracies in Pyrometry

Improvements in magnetic and electrical insulation and in sheathing and protection of couples in furnaces are described in recent paper by British chemists.

THE study of pyrometry as a separate subject is often neglected in manufacturing plants, and it certainly has not received the attention which the great influence of temperature control on the quality of many manufactured products warrants. Pointers on the practical use of pyrometers were given in a paper read before the Institute of Metals at its recent Liverpool meeting. These are based on experience with pyrometers in the aluminum industry, but problems arising in other branches of industry in connection with the measurement of high temperatures often are quite similar, and permit of similar solutions. The paper referred to was by G. R. Brook and H. J. Simcox, chemist and assistant chemist respectively of the Research Laboratories of the British Aluminum Co., Ltd.

For years great difficulties were experienced with magnetic and electrical insulation, and with sheathing and protection of the couples in the furnaces. These difficulties were overcome, and it is with the methods employed in overcoming them that the paper deals.

At the plant of the aluminum company the reduction furnaces are arranged on opposite sides of a rail track, and along each row of furnaces there are bus bars which in some instances carry over 20,000 amperes. To take the temperature of a furnace it is necessary to place the instrument between the rows, and the magnetic field due to the bus bars naturally exerted considerable influence on the temperature indicators. By placing the instrument in such a position that the magnetic effect was substantially symmetrical to the known field, magnetic interference was minimized and tolerable results were obtained when all adjacent furnaces were going, but when a furnace on one side was cut out, serious inaccuracies resulted.

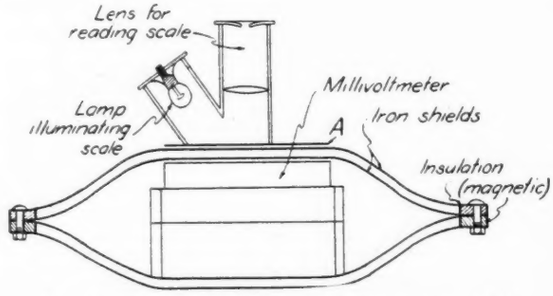


Fig. 1—Magnetic shield for temperature indicator

To obtain better results, shielding was resorted to, but this, too, presented difficulties at first, due to the fact that an ordinary millivoltmeter when fully shielded, is very cumbersome. A millivoltmeter of compact size, made by the Weston Instrument Co., was found, the base of which measures about 4 by 5 in., and which has a scale that can be read to 0.5 millivolt with the naked eye and to 0.25 millivolt with a single lens. This instrument was magnetically shielded by means of two dished stampings of soft steel, in one of which it was placed, while the other, inverted, was placed over the top. A slot was cut in the top plate to expose the scale, and a small lens was mounted for reading the scale.

This magnetic shield worked satisfactorily at first, but after a certain time trouble from magnetic influence reappeared. After "resting" the shield for a day or two it worked all right again. This suggested that it was made of the wrong kind of iron, for the trouble was due to residual magnetism.

Next, at the suggestion of Prof. Ernest Wilson of Kings College, London, a new double shield was made, of Swedish iron, four plates being used, with an airspace between those on the same side. The pan-shaped shields were stamped with ordinary soup-plate dies, thus making their cost low. As shown by the sectional view, Fig. 1, the plates are magnetically insulated from each other. A practical test showed that the method of shielding was effective. The unshielded instrument used in regular practice, when rotated through an angle of 180 deg., showed an error of 2-3 millivolt, the latter equivalent to 50 deg. C., while with the shielded instrument the error was never greater than 0.5 millivolt, equal to 8 deg. C.

Screening Plate Added

A further refinement added later consisted of a circular screening plate *A*, which revolves concentrically with the telescope. For greater accuracy a low-power lens is mounted above the scale, which latter is illuminated by a 2 c-p. lamp in a side tube set at an angle of 30 deg., with the vertical tube. This solved the problem of accurately reading a small scale through a deep shield, while at the same time the limited field provided a self-centering reading which is virtually fool-proof in the hands of an unskilled assistant.

The recorders controlling the reheating furnaces developed inaccuracies on various occasions. At first the trouble was thought to be due to the recorder itself, but on one occasion, on testing the insulation in the line wires, it was discovered that the insulation on the couple wires had become ineffective. This was found to be due to a coating of black oxide of iron and finely divided carbon on the outside of the insulation. In some cases the oxide had penetrated to the center. It has been suggested that this trouble arose from machine oil resident in the iron sheath, and the iron oxide evidently came from the same source. Insulators which become discolored are now discarded.

Some of the recorders used have four circuits, of which two are always recording. On one occasion, on disconnecting the negative lead from one of the couples,

it was found that the recorder continued to give two temperature records, although only one thermo-couple was properly connected. On investigation it was found that the couple was making contact with the iron sheath, and the NiCu element constituted with the iron sheath a subsidiary false thermo-couple. This was overcome by placing a thimble of insulating material (fused silica or high-resistance refractory) over the end of the couple.

Special Cable Insulation

The authors found it absolutely necessary to use lead-covered, paper-insulated cable for the connection from the cold junction to the recorder. Formerly ordinary cable was used for this connection, being fixed by cleats to overhead beams and girders, but it was found that the insulation soon broke down and this resulted in inaccuracies in the recording instrument. The leads are now laid in underground ducts, and while the initial outlay for such installation may seem high, experience shows that where trouble from stray currents always threatens it is an economy in the long run.

The British Aluminum Company's research laboratory makes its own thermo-couples, for which it buys the wires in coils from the mills. The wires used are known as Ferry and Ferrozoid, the latter, a nickel-chrome steel, being the positive. Ferry wire consists of 54 per cent copper, 45 per cent nickel and 1 per cent manganese, and is quite low in cost. The thermo-electromotive force is conveniently large, about 60 m.v. at 1000 deg. C. The makers of the wire state it should not be used above 1000 deg. C., but the authors say they have obtained accurate results with it at up to 1100 deg. C.

These thermo-couples are used principally for recording the temperature of reheated aluminum while in the furnace, immediately prior to casting in the ingot molds. It is well known that aluminum at a temperature of 750 deg. C. will attack almost any metal and great difficulties were encountered at first in finding a suitable sheath for such couples. Originally ordinary seamless steel tubing was used, coated on the outside with French chalk, but the life of such sheaths was at most a week. There was constant trouble from the aluminum attacking the sheath, eating through it and causing the thermo-couples to fail. After numerous alloy steels had been tried the use of cast iron was hit upon, and this proved eminently successful; as against a life of one week for the seamless tube, the cast-iron sheath lasts six months or more. The cast iron sheaths must be further protected, however, by a daily wash with a mixture made up of equal parts of French chalk and graphite in a 10 per cent sodium silicate solution. This should be mixed to the consistency of a thick cream, and a 1/16-in. coating applied, care being taken that any cracks that may form on drying are filled in.

Freedom From Short Circuits

The above refers to the outer sheaths, which are in contact with the aluminum. The couple is mounted in a seamless steel tube, with a head of the type shown in Fig. 2. Ease of inspection, security and freedom from short circuits are the outstanding features of this design, for which the authors claim credit. The latter point is of particular importance when the couples are being handled constantly by unskilled persons who, when disconnecting couples, force the terminals off instead of unscrewing them. This quite often loosens the inside connections, damaging the couple or distorting the wires, thus causing short circuits with the sheath. This is said to be almost impossible with the form of head shown in Fig. 2, which consists of a cup covered with an ebonite disk holding the terminals. The latter, which have a "straight through" hole for the couple wire, are held firmly to the ebonite by the lock nuts, the wire being secured by grub screws. By this means security and good contact are obtained, and if the ebonite is renewed occasionally, such heads will last for years.

In connection with couples used for measuring the temperatures of gas-fired furnaces, it is a comparatively easy matter to protect them against furnace gases at between 400 and 1000 deg. C., but at higher temperatures the problem presents increased difficulties. Gases such as sulphur dioxide pass through the sheath quite readily, and at these temperatures they attack practically all metals, nickel and nickel alloys being particularly sensitive to attack. In carrying out a temperature survey of the inside of a producer-fired ring-type furnace, couples with one wire made of an alloy rich in nickel and sheathed in a steel tube, failed in succession when a temperature of 900 deg. C. was reached, even fusing in the tube, so that they could not be removed and replaced during the period of firing. The sheath, on account of the producer firing, was partly in contact with finely divided carbon, and the atmosphere therefore was reducing during the earlier period and oxidizing later. An examination of one of the damaged tubes showed it to consist of laminae of oxides which broke quite easily in the hand, while the couple wire was quite brittle. Micro-examination of the couple wire revealed large pools of sulphide around the grain boundaries, which showed that sulphur was the cause of the trouble. The last 2 or 3 ft. of the couple sheaths was then placed in a jacket containing lime, with a view to absorbing the sulphur. The couples then remained sound throughout the period of baking, although 1100 deg C. was exceeded. The authors state that the use of lime for this purpose is new, and since the same conditions are met with in almost all annealing furnaces, lime protection may find wide use. The lime layer showed 3.0 per cent sulphur after only 30 hours.

Fig. 2 — Special head for thermo-couple

Where casting temperatures must be known at frequent intervals, a sheathed couple is open to the objection that it has a time lag, and to eliminate errors due to this cause it is necessary to preheat the couple each time. The delay attendant upon this practice can be avoided by using a couple in which the contact of the wires is made by the molten metal, as described by Marsh in *Foundry*. Marsh uses a couple with wires which are insulated only to within ½ in. of the end, and the wires are not twisted. The couple is immersed to a depth of 3 or 4 in., so that, although virtually a bare couple is used, the temperature of the center of the pot is measured.

Marsh used asbestos for the insulation of the wires, but the authors found this would not answer in their case, as short circuits developed after one or two immersions. This difficulty was overcome by insulating the wires with silica tubing of small bore and binding the latter with asbestos cord (more as a protection against leakage of the silica than as insulation).

NEW DEVELOPMENTS—Automotive

Chicago Rivet Squeezer

A NEW machine which squeezes light rivets into place instead of driving them has been developed by the Chicago Pneumatic Tool Co., 6 E. 44th St., New York. This machine, designated the CP Squeeze Riveter, is made in two sizes, the smaller one weighing 8 lb. and being capable of driving steel rivets up to ⅛ in. diameter, duralumin rivets up to 5.32-in. diameter and aluminum rivets up to 3/16-in. diameter. The larger machine weighs 16½ lb. and can drive steel, duralumin and aluminum rivets of 3/16-in., 5/16-in., and ⅜-in. diameter respectively.

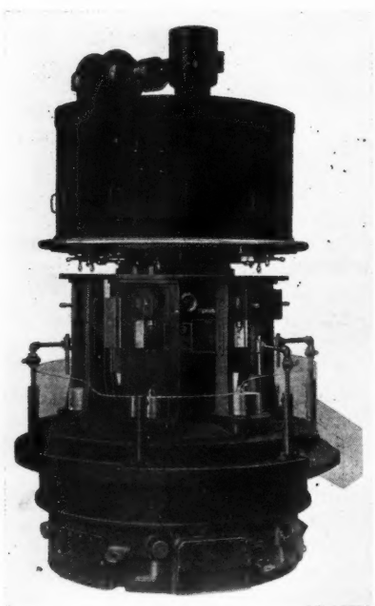
CP Squeeze Riveter

The yoke is quickly removable and a wide range is provided for almost any size of gap and reach.

Bullard Center Lathe

THE most recent addition to the line of Mult-Au-Matics being made by the Bullard Machine Co., Bridgeport, Conn., is a center lathe which has a number of features that make it particularly fitted for high production work in automotive factories.

The machine has six spindles, at each of which independent speeds and feeds are available, so that at each work station the operation can be performed in the best possible manner. Work is held vertically between centers. A live center tail stock is mounted above, between guides secured to the work spindle carrier and is held in place by a steady ring. These tail stocks are adjustable for work up to 12 in. long, and each is operated by one lever which drops it into place and binds it with one motion.



New Bullard Mult-Au-Matic center lathe

The work is held and driven at the lower end by a power-operated chuck or other special device so that the pressure for all feeding cuts except underfacing is carried by the lower bearings.

The registering position of the work spindles in operation is not directly below the tool head but is between the tool faces of the column in such a position that the tool slides and heads mounted on the regular faces of the column are brought into vertical and horizontal traverse to the point of cutting and retired to provide clearance in indexing the work.

One work station has no tool head and here the spindle is stopped for loading and unloading the work. At the five other stations work heads are mounted. They are traversed rapidly downward and to the left to the point of cutting where feed motion is engaged. The tools feed through the cut and then retire back and up.

Clearance is provided for work up to 4 in. diameter for the full length of 12 in. Work 10 in. in diameter up to 7¾ in. long can be handled, as can flanged pieces which must be faced.

Tool setting may be accomplished by individual or block type tool holders. Adjustment of individual feeds and speeds for the five heads is made by change gears on individual feed work brackets in the upper compartment. Lubrication is provided for all bearings and wearing parts through a pump in the base which raises filtered oil to a distributing tank at the top of the machine, whence it is carried by gravity to all parts of the machine. A cutting compound system of ample capacity is also provided.

The new lathe is driven by a 10 hp. constant-speed motor running at 1800 r.p.m. and direct-connected through a flexible coupling. The machine stands 128 in. high and occupies a circle of about 77 in. diameter with an additional space of 29 by 15 in. required for the settling tank.

Tests have demonstrated that important production economies can be made through the use of this machine in producing many automotive parts. The machining of the spindle and brake drum flange of a steering knuckle which required 3½ min. on a single spindle machine can be performed in the new center lathe in 50 sec. A stem pinion job requiring 4½ min. in a horizontal lathe has been produced in the vertical center lathe in 50 sec.

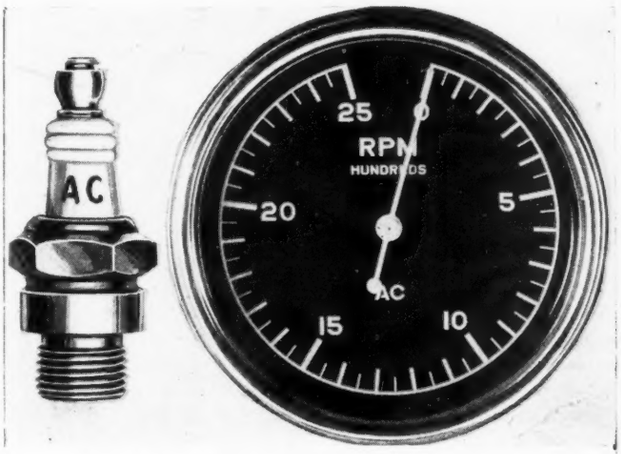
AC Aircraft Instruments

A LINE of specially designed aircraft instruments is now being offered by the AC Spark Plug Co. Included are ammeter, oil pressure gage, oil temperature gage and tachometer. The ammeter is of the normal type having an unusually steady pointer, this desirable characteristic for airplane use being obtained by carefully proportioning the weight of the pointer and the strength of the magnetic field.

The basic part of the oil gage is the Bourdon tube, which changes its shape with pressure, this movement being transmitted to the pointer. The principle of vapor pressure is used for the oil temperature gage. A bulb immersed in the cooling water of the motor is partially filled with a liquid of high volatility. Pressure is transmitted through a small brass tube to the indicator.

The new tachometer is a magnetic type instrument with compensation for temperature variations. In prin-

Parts, Accessories and Production Tools



New AC aviation spark plug and tachometer

ciple it is similar to that of the AC speedometer. It is simple in construction, having but a single moving part, to assure long life under adverse operating conditions. The indicating element is mounted in sapphires with a permanent magnet formed of tungsten steel.

In addition to these instruments a new spark plug designed specifically for high-speed, high-compression aircraft engines and for regular aircraft engines operating at sustained wide open throttle has been added to the AC aviation spark plug line. The new plug has a cross wire electrode, specially designed to prevent preignition at this point.

New Welding Equipment

A NUMBER of new items have been added to the line of welding equipment manufactured by Torchweld Equipment Co., 224 North Carpenter St., Chicago. The new 18MC one-piece-tip construction torch and the 28MC two-piece-tip construction torch have metal-to-metal seats and are positive in action and leak-proof. A new cutting attachment has been developed for the Nos. 1, 2, 3, 4 and 6NF torches, and a new No. 95 special light sheet metal torch for use in aeroplane and similar light work has been developed.

The new Torchweld oxygen regulators with a safety release valve have been developed to prevent damage to gages, diaphragms and seats. When the oxygen pressure becomes excessive in the regulator body an automatic safety valve releases it down to a safe load.

THE Stanley Works, Box Strapping Division, New Britain, Conn., has developed two safety products designed to add to the safety of workmen handling box strapping in shipping departments. One product—the Eversafe box strapping—has round ends and edges, so that there is no chance of the workman cutting himself, and has a sterilized japan finish.

The second product—Eversafe round end cutter—can be used with almost any kind of box strapping and cuts two round ends at one clip.

Packard Paint Striper

THE paint striping machine illustrated herewith is a development of the Packard Motor Co., which manufactures the units and sells them to other manufacturers on a lease and royalty basis. The tool is not designed to be universal, but is separately designed for each type of body striping for which it is to be used. Briefly, it is composed of a small internal gear pump actuated by rollers which in turn serve as guides, straddling the body molding, etc., and ejecting the lacquer through a paint nozzle, of which there may be one or more as required by the body design.

The device takes the striping of a body (or other parts such as hood louvres) out of the hands of the highly skilled artisan and makes the use of unskilled labor for this work possible.

When not in use the stripers are kept immersed in clear lacquer. To clean the instrument the reservoir is filled with lacquer solvent which is then ejected through the nozzle by turning the guide wheels by means of a small belt-operated bench wheel.

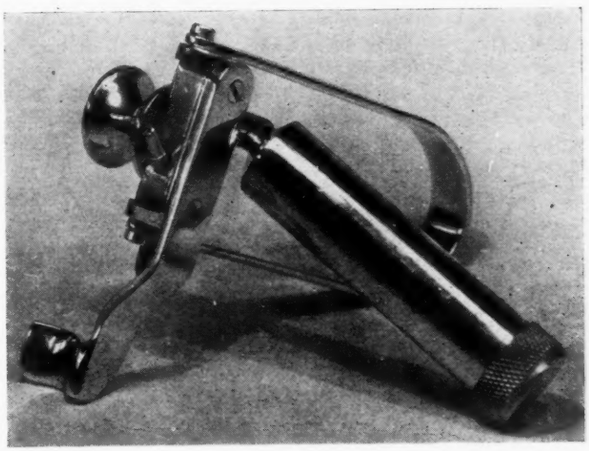
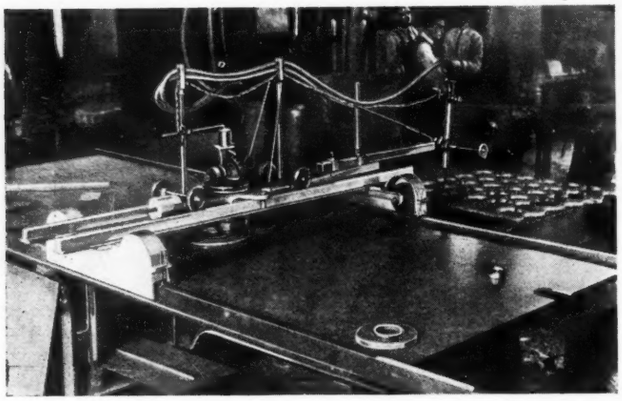


Fig. 1—Packard striping machine

Fig. 2—Showing use of striping machine



Automatic oxy-acetylene shape cutting machine

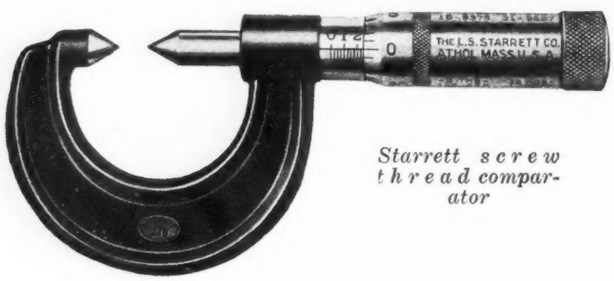
Oxweld Shape Cutting Machine

AN automatic oxy-acetylene shape-cutting machine designed to cut shapes of any sort from steel plate, sheet, forgings, billets or ingots is being introduced by the Linde Air Products Co., 30 E. Forty-second St., New York. In this machine the cutting blowpipe is mounted on a carriage which is moved in any direction by means of an electric motor. For routine production it will operate automatically from templets. In cases where only a few parts are to be cut out a hand tracing device can be attached and used to follow the outline of a sketch or blueprint.

The Oxweld shape-cutting machine requires but one operator. Little machining is necessary in most cases after cutting because the parts are produced with straight corners and smooth faces.

Screw Thread Comparator

THE L. S. Starrett Co., Athol, Mass., has recently brought out a new No. 210 screw thread comparator which is designed not only for measuring screw threads but for work in small grooves and recesses where ordinary micrometers can not be used The anvil and spindle contacts are conical but are flattened about



Starrett screw thread comparator

1/64 in. so that it will not measure the actual diameter of a screw thread but does permit comparison.

This new device comes in two sizes to measure from 0 to 1 in. and from 1 to 2 in. It is also furnished in metric measure.

Gits Pressure Lubricator

A NEW pressure lubricating system has been developed by Gits Bros. Mfg. Co., 1940 So. Kilbourn St., Chicago, by means of which pressures up to 3000 lb. can be obtained with a hand compressor and up to 10,000 lb. with a compound compressor of leverage type.

Any lubricant from kerosene to No. 5 cup grease can be used in it and its simplicity of operation and strength of design makes it suitable for use wherever high pressure lubrication is required. A short turn of the gun to the right makes a perfect leak proof connection between the nozzle valve and the fitting. After forcing in lubricant a turn to the left disengages the gun and closes the check valves.

Dirigible Contracts Awarded

SECRETARY of the Navy Curtis D. Wilbur and President P. W. Litchfield of the Goodyear Zeppelin Corp., Akron, Ohio, have signed contracts for the construction of the two new naval dirigibles at a cost of $7,825,000. Work on the dirigibles will begin immediately, although the site for construction of the hangar, which is also included in the contract, has not yet been selected. The contract provides that the first airship shall be completed in 30 months and the second 15 months afterward.

There are two contracts involved—one for $5,375,000 for the construction of the ZRS-4, including designing and the cost of the hangar, and the other for $2,450,000 for the actual construction of the ZRS-5. Under the contract the hangar, after construction is completed, will be retained by Goodyear for future airship construction.

The contract price is $175,000 under the $8,000,000 limit set by Congress for the construction. The original bid of the successful company was $7,950,000, but in progress of negotiations the contract price was reduced.

The importance of the new project is stressed by the Navy Department in an official statement comparing the new airships with the Los Angeles, heretofore regarded as a monster in rigid airships. The Los Angeles was designed in 1922 and completed in 1924.

A comparative table of specifications was presented as follows by the Navy Department:

	Los Angeles	ZRS-4
Nominal gas volume	2,470,000 cu. ft.	6,500,000 cu. ft.
Length overall	658.3 ft.	785 ft.
Maximum diameter	90.7 ft.	132.9 ft
Height overall	104.4 ft.	146.5 ft.
Gross lift, lb.	153,000	403,000
Useful lift, lb.	60,000	182,000
Number of engines	5	8
Total horsepower	2,000	4,480
Maximum speed, knots	63.5	72.8
Range without refueling at a 50-knot cruising speed Nautical miles	3,500	9,180

From the table it will be seen that the new airships may go more than two and a half times as far as the Los Angeles without refueling, a feature of outstanding value, it is pointed out, when long distance scouting at sea is considered.

THE wings of most flying birds are provided with an auxiliary wing or alula, it was pointed out by Dr. A. P. Thurston at a meeting of the British Association for the Advancement of Science. These auxiliary wings are generally extended and separated from the main wing when the bird is starting, alighting or soaring. Dr. Thurston said experiments had shown that similar alula could be used on aircraft for purposes of control, and he gave a description of different ways in which they can be employed in flying.

Just Among Ourselves

Thumbs Down on the Thumb-Jerkers

HITCH-HIKERS, prominent among the many irritations of present-day motoring, are going to be in for a bad time of of it in New Jersey from now on. The New Jersey traffic law which went into effect Sept. 1 embodies a clause making it an offense for anyone either to ask for or offer a ride anywhere on the open highways of the state. How effectively the law accomplishes its purpose remains to be seen. Certainly it should aid in eliminating this additional hazard to motoring. Every little bit helps.

* * *

New Production Records Made Under Difficulties

THE production records which the industry has been setting up for the last few months are especially remarkable when the manufacturing difficulties encountered by a number of important companies are taken into consideration. One big company had to delay a new model announcement for lack of bodies; another turned back a good many deposits in recent months because it couldn't supply the particular models needed, although other types were on hand; another has been unable to keep up with demand in several weeks because of lack of certain types of skilled workers needed for completion of the job; another has been changing and realigning its plants and its models during a period of severe pressure for cars from its dealers; changes over to new models have kept more than one plant from its production capacity; Ford still has not reached his peak. Yet in the face of these difficulties, the production men of the industry have turned out more automobiles and better automobiles than ever before. All of which shows that constant change practically has become a routine and that estimating that mythical entity "production capacity" gets to be a tougher job every year. If the industry can do what it has under the conditions of the last few months, what could it do with perfectly smooth manufacturing operations?

* * *

Closer Tie-up With Aircraft Industry

WITH Ford, Velie and Gardner now among the car manufacturers already in the airplane manufacturing business, and with Packard, Auburn (through Lycoming) and Continental making engines for aircraft, the tie-up between these two modern transportation industries is getting closer and closer as time goes on. It is true, of course, that a large proportion of the powerful airplane companies today are not affiliated directly with the automotive field, but through the parts and supply industry, as well as through direct activities, the two fields do bid fair to be closely related as a permanent thing. This is as it should be. The automobile manufacturer does well in taking a leaf from the book of the telephone companies which, instead of opposing radio and wireless development, made themselves leaders in it. It is far better for an established industry to take a hand in the development of new industries which may be coordinated with it than to turn its face backward and merely try to maintain a *status quo* which economic necessities are likely to change sooner or later in any case.

S.A.E. Extending Aviation Activities

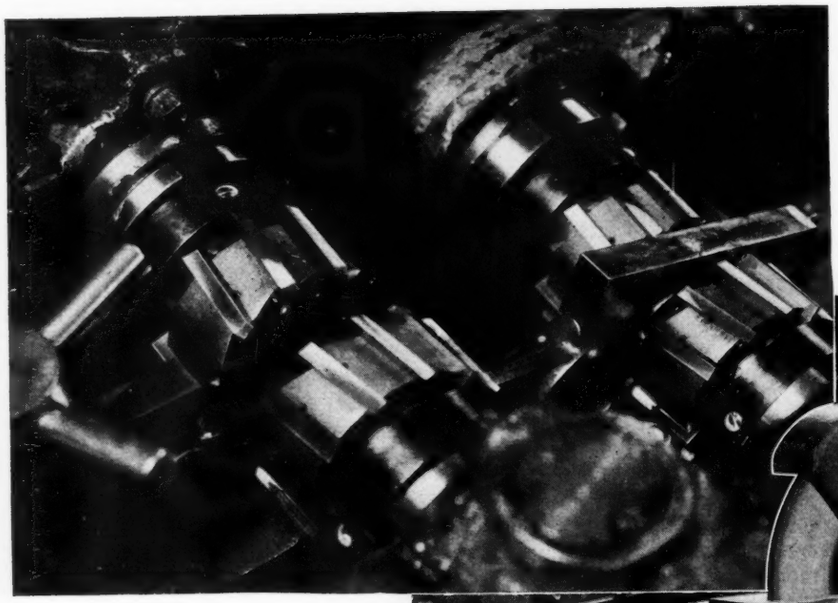
WITH the recent organization of what bids fair to be a strong aviation division as part of the Metropolitan Section, the Society of Automotive Engineers continues its vigorous activity in the aviation field, Coker F. Clarkson, the Society's secretary, has just completed a trip to the Coast during which, it is understood, he not only attended the air races and the meetings coincident with them, but also contacted practically all of the airplane manufacturing organizations in the West. Quite fittingly, too, he made one or two long airplane hops during the trip to enable him to cover a wider area in the relatively short time available. One hop was from Denver to Lake Placid, N. Y., and another from Lake Placid back to headquarters at New York City. Certainly the S.A.E. general manager is doing his share to help make us all air-minded.

* * *

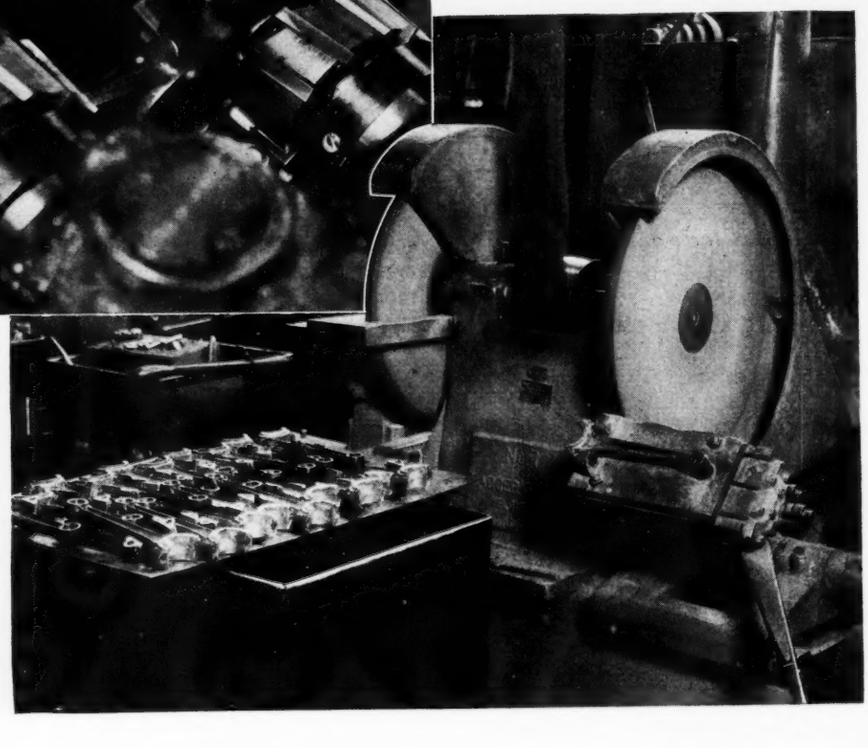
Large Turnout for Show Drawing

THE N.A.C.C. show drawing last week was attended by a goodly number of important factory executives despite the competition of the opening game of the World's Series and the Paris automobile show. The order of drawing showed a number of variations from the previous year, as is always the case, but the increased size of the spaces and the generally new layout of the show this year gave practically everybody a better break than they had before. One feature of this year's drawing was that it got started ahead of its scheduled time. That is almost a record for automotive gatherings—or business gatherings of any kind, for that matter.

—N. G. S.



Left—A Cincinnati milling machine is used to rough mill both sides of both ends of the rod in a single operation



Right—The joint faces of the rods are ground in this Badger disk grinder

Reo Connecting Rods Machined Without Distortion

Wrist pin hole is finish-reamed and then used as means of location during crank end operations.

By K. W. Stillman

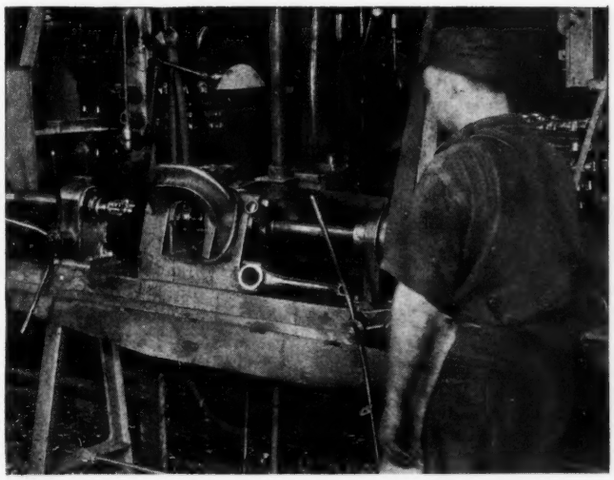
IN laying out the production routing for connecting rods, Reo Motor Car Co. production engineers make no provisions for straightening after heat treatment. They, with several other manufacturers, believe that the shape assumed by the rod after heat treatment is its permanent form, and that any subsequent straightening may have only temporary value once the rod is placed under the stress of service.

In general, any necessity for straightening the rods is avoided in the Reo plant by finish-reaming the wrist pin hole very early in the machine line and then using this finished hole as a means of location, supporting the rod for crank end operations so firmly that distortion under machine tool stresses will be negligible.

The first operation, in a Cincinnati 24-in. double-head milling machine, mills both sides of both ends to provide a flat surface for locating the rod for the drilling operations which follow.

The 15/16-in. hole in the pin end is rough-reamed to .974-in. diameter and countersunk 1/32-in. on both sides in a Natco double-end drill press. Then the small hole is finish-reamed with a tolerance of plus 0.000, minus 0.0005 in. in a Barnes drill and the nut seat for the clamping bolt milled in a Habercron & Wood drill press.

A 3/32-in. slot, 1⅞ in. long, is sawed in the pin end by means of another Cincinnati milling machine and the clamp bolt hole in the small end is burred. A friction tapping machine is utilized next to tap a 5/16-24 hole for the clamping bolt, after which operations are taken up at the crank end of the rod.



This special lathe finish reams the crank hole and finish faces one side of the crankpin boss

The first step there is to mill a wrench clearance for the two nuts at the crank end, which is done in an 18-in. Cincinnati miller, and then the bolt holes are drilled and reamed in a Fox multiple-spindle drill.

The cap is then sawed from the rod in a 24-in. Cincinnati milling machine and milled for the bolt head seat. The cap and rod are then placed back together in a fixture and a 2¼ in. diameter hole bored in a Baker four-spindle drill. A 1/32-in. chamfer at 45 deg. is made at the bench in the crank hole and the cap and rod are wired together.

The assembly is washed, acid and tin applied and babbitt is die-cast under pressure.

The two bolt holes in the crank end are reamed and burred both in the cap and the rod, and the joint faces of both caps and rods are ground in a Badger disk grinder. Burrs are filed at the bench, after which the rods and caps are assembled by means of the bolts.

Locating points on the bolt bosses on each side of the crank end of the rod are hand filed and faced and these, with the finished wrist pin hole, serve to locate the work in a Barnes drill where the crank hole is semi-finish reamed.

Both sides of the crank end are then rough faced and filleted in a Cincinnati drill press, after which the babbitt is rough-reamed and the sprue faced in a Cincinnati milling machine.

The rod is now wire-brushed complete and all burrs and nicks are cleaned off. In a Henry & Wright three-spindle drill an oil hole is drilled in the crank end, consisting first of a ⅛-in. drill 9/16 in. deep, then drilled through with a 1/16-in. drill and the entrance countersunk to remove burrs.

The crank hole is finish-reamed and one side finish-faced in a specially built reaming lathe. About 0.002 in. of babbitt is removed in this operation with a tolerance of plus or minus 0.001 in. The other side of the crank end is finish-faced and filleted in a Cincinnati drill press, after which the crank hole is burnished by broaching in a Fox press. No plus tolerance is permitted in this operation while the minus tolerance is 0.0005 in.

This completes the machine operations, there remaining only final washing, weighing and inspection.

Thickness of the rod at the crank end is given a minus tolerance of 0.001 in. to permit end play on the crankshaft of from 0.002 to 0.004 in. Rods are designed to be fitted with from 0.0015 to 0.0025 in. clearance.

Tolerance in distance between centers of crank and wrist pin holes is plus or minus 0.005 in. Bolt holes in the crank end are given no minus tolerance but may vary as much as 0.0005 in. above the nominal size.

Small Caterpillar Tractor

THE Caterpillar Tractor Co. is about to place on the market a new small tractor known as the "Caterpillar Model 10." It will have 10 drawbar hp. at 1500 r.p.m., as compared with 15 for the next larger one, the smallest the company has put out in the past. The engine delivers 14 hp. on the belt.

The new creation is the result of a demand for a somewhat cheaper machine and one that can be used to better advantage in small spaces. The 15 hp. model weighs about 5500 lb. and sells for $1,675, f.o.b., Peoria, Ill. The 10 hp. will weigh about 4000 lb. and will be cheaper, though the exact price has not yet been set. Production is expected to start in December, but deliveries will not begin until January.

The new engine is of the four-cylinder, L-head type, with a bore of 3⅜ in. and a stroke of 4 in. The crankshaft bearings are 2⅛ in. in diameter; the camshaft bearings, 1⅞ in. Pistons are 4¼ in. long and carry four rings each, three above the piston pin.

A six-bladed fan is fitted and is driven by a ⅞-in. V-belt. Gasoline is used as fuel and is carried in a 17½-gal. tank. Cylinder heads are of the Ricardo type. The crankcase and cylinder are cast of gray iron in one block.

There are three main bearings on the crankshaft, of the bronze-backed, babbitt-lined type, the shell being fitted into heavy gray-iron caps, which are set into milled slots in the crankcase to insure correct alignment. The center bearing is flanged to take the crankshaft thrust.

The camshaft is drilled and forms the main oil lead for pressure lubrication of the camshaft and crankshaft bearings. A scavenging oil pump is provided to keep the front end clear when the tractor goes down steep hills. A governor is mounted on the accessory shaft, which latter also drives the magneto.

The water pump is on the fan shaft and set into the front of the cylinder block.

Caterpillar Model 10 tractor

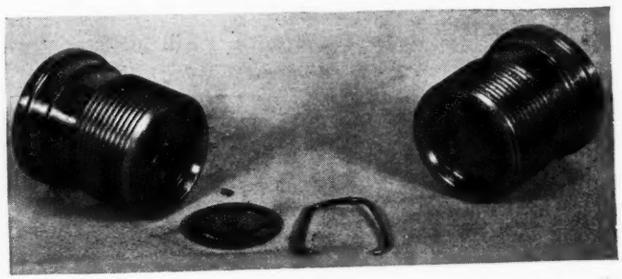
Spring Shackles Eliminated by New Hydraulic Shock Absorber

Device offered by Baker Wheel Co. as original equipment also serves as bumper bracket. Plunger piston attached to spring horns. Unit consists of nine parts.

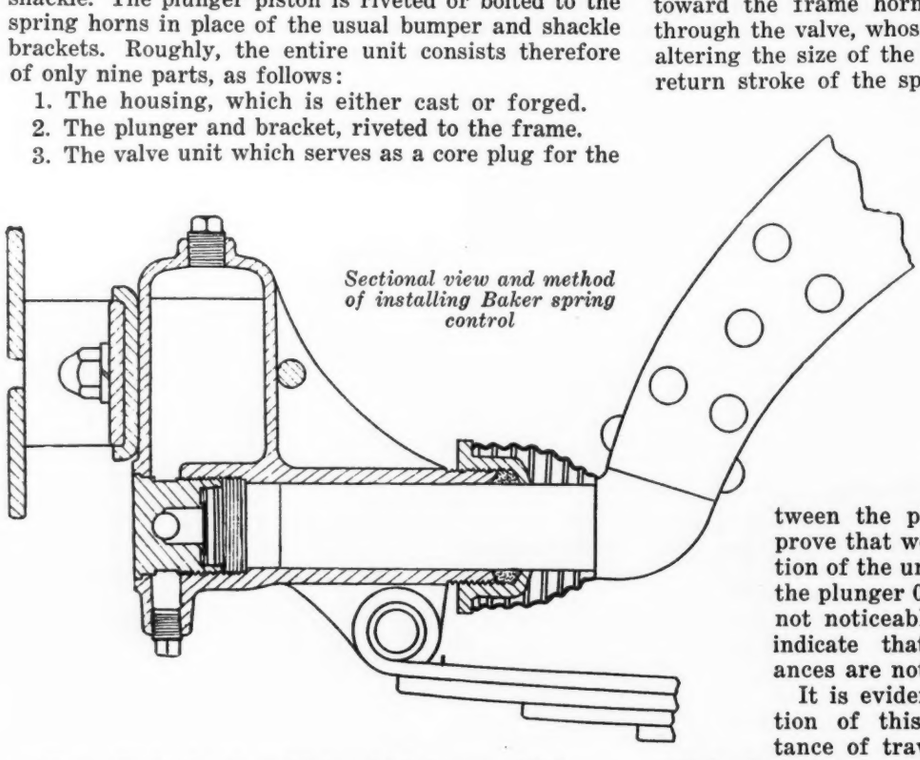
A NEW hydraulic spring control developed by the Baker Wheel Co., of Detroit, is being offered to the automotive industry for original equipment installation. Its outstanding features are that it eliminates the spring shackle; reduces the number of parts used; is double acting; manufacturing cost is low; manufacturing tolerances do not have to be held to close limits so that wear will not materially affect the operation; it reduces the vertical motion, velocity and acceleration of bodies for a given spring deflection; is easily adjustable in production to give the best results for each body weight and adjustment in service is simple; serves as an integral bumper bracket; elimination of the shackle reduces chassis parts requiring lubrication; provides a ball and socket action for the chassis springs, thus permitting one spring to deflect without effect on the opposite spring; it is more readily accessible than the usual shock absorber mounted on or above the axles.

The unit is assembled on the car in place of the spring shackle. The plunger piston is riveted or bolted to the spring horns in place of the usual bumper and shackle brackets. Roughly, the entire unit consists therefore of only nine parts, as follows:

1. The housing, which is either cast or forged.
2. The plunger and bracket, riveted to the frame.
3. The valve unit which serves as a core plug for the casting cylinder head, and into which is assembled:
4. The valve disk, which is simple, flat stamping.
5. A spring wire clip retainer for the valve disk.
6. A filler plug for the reservoir.
7. A drain plug for the same.
8. A leather or composition packing ring.
9. A packing nut.



Valve unit, showing disk and spring wire clip retainer



Sectional view and method of installing Baker spring control

In action, when the spring is deflected the housing part of the unit moves away from the spring horn, permitting oil to enter fairly freely into the plunger chamber through the valve. If the spring is deflected past its center point, the unit will move back again toward the frame horn and oil will be passed back through the valve, whose operation can be governed by altering the size of the hole in the valve disk. On the return stroke of the spring there will be free spring action until the spring has passed its center point with the oil again entering the plunger chamber, while the checking action again comes into effect after the spring passes its center point and the flow of oil is reversed.

As far as wear is concerned, the plunger which carries the load is quite large in diameter and has considerable bearing area. Moreover, the action of the unit is such as to maintain a constant film of oil between the plunger and the cylinder. To prove that wear would not affect the operation of the unit, a sample was made up with the plunger 0.005 in. undersize. Action was not noticeably different. This would also indicate that close manufacturing tolerances are not a requisite with this unit.

It is evident from the nature of the action of this unit that the vertical distance of travel of the motor vehicle body will be less than with the standard shackled spring type of construction for a given spring deflection, since in addition to the deflection of the shackled spring there is an additional vertical motion due to the vertical component of the arc through which the springle shackle

travels during a spring deflection. This factor is quite important on cars which have considerable camber to their springs, on which this unit is particularly effective.

Adjustment of the unit is by means of the pressed steel valve disks. Characteristics depend mostly on the small hole in the center of this disk, which is easily variable. In service, adjustment is made by unscrewing the core plug or valve cage, and replacing the disk with one having a smaller or larger center hole. Adjustment for the opposite direction of flow for the fluid could also be made, either by varying the center hole in the valve cage, or the outer holes in the valve disk, but such an adjustment will probably be unnecessary as a free flow of oil is in general desired with this type of construction so as to obtain rapid refilling of the cylinder.

The use of the spring control for a bumper bracket brings with it another advantage, that of oil cushioning the bumper. On impact the tendency will be to pass the shock more directly through the spring to the axles and wheels rather than to let it pass into the frame and body. The action of the unit when the bumper is hit also has the effect of raising the body of the car slightly, thus translating some of the horizontal impact into vertical motion and decreasing the shock.

High-Speed Diesel Engines

SOME of the latest developments in connection with high-speed oil engines in England were bared at a session of the British Association for the Advancement of Science, at which a paper on the subject was read by A. E. L. Chorlton, of W. Beardmore & Co., Ltd. Mr. Chorlton said that for aircraft purposes an oil engine must develop a brake mean effective pressure of at least 100 lb. p. sq. in., and 120 lb. is preferable. It is therefore necessary to utilize practically all of the air entering the cylinder for the combustion of fuel. The relative amount of excess air passing through the engine also has an important effect on the economy. While the fuel spray must completely permeate and penetrate the air charge, there must be no interference, and this makes it necessary to consider whether it is better to use a single spray jet or several, and in the case of a single jet, whether it is best to mount it in the center of the head or elsewhere. A number of different jets in a single combustion chamber assure quick combustion, but there is danger of interference.

After extended experiments, Wm. Beardmore & Co. developed a satisfactory engine of the heavy oil type, and some results obtained with it were given in an Institute of Mechanical Engineers paper in March, 1926. In the tests then reported upon, the engine was shown to have a specific fuel consumption of 0.35 lb. p. b.hp.-hr. Since that time further improvements have been made, and recently a fuel consumption figure of 0.32 lb. p. b.hp.-hr. was reached, with an eight-cylinder engine of 8¼ in. bore and 12 in. stroke, developing 650 hp. at 1000 r.p.m. This is equivalent to a thermal efficiency of 40 per cent. The engine structure is in a single casting, and if steel is used the weight is 4600 lb., while with aluminum it is 3600 lb.

An experimental engine has been built for the L. M. & S. Railway for use on an oil-electric locomotive. Sir Henry Fowler of that railway was present and said that he objected to the high cost of the electric transmission, and that he would much prefer a transmission which was cheaper, referring to the cost of interest, depreciation and maintenance necessitated by the electric gear. The locomotive had not been used long enough to give definite results, but these would be given later. It had been in service since July 25, and its operation had been on the whole satisfactory.

R. G. Gage of the Canadian Railways said that they had 14 railcars with Beardmore heavy oil engines in service at present. The cars were operating on lines from 100 to 350 miles in length and the traffic was light and the stops few. The cars operated by them had engines of from 200 to 400 hp. One thing that had given them some trouble was the big end bearings. At present it could not be said that the possibility of failure of big end bearings had been eliminated. It seemed to be a question of design, as to the proper grade of babbitt and whether it should have bronze or steel backing.

Erskine Six Royal Sedan

SMART body lines, the latest colors and wire wheels with two spares mounted in the front fenders are features of the Erskine Six Royal sedan, an entirely new model recently announced by the Studebaker Corp. Price is $1,045.

The color scheme is Alcona gray and sable, with deep orange wire wheels and orange and ivory striping, and window reveals in Ute brown.

The radiator shell is topped with a winged radiator cap and plated headlamps are joined by a plated tie rod with an "E" medallion in the center. Cowl lamps are mounted on a nickeled bead, and are miniature replicas of the headlamps. Additional bright touches are found on the large diameter hub caps and there is a folding luggage grid at the rear.

The interior is upholstered in mohair and is proportioned to seat five passengers. The rear seat is flanked by arm rests. Appointments of the rear compartment include a recessed ash receiver, silk curtains in rear and quarter windows, and dome light controlled by a switch in the door post. Door and window moldings are finished in sable lacquer.

Instruments are grouped on the Alcona gray and sable lacquer-finished instrument board in a dull silver frame against a mat of old ivory, and are indirectly illuminated for convenience at night. A hydrostatic gasoline gage supplements the usual instruments.

New Erskine Six Royal sedan

First with the News

Reliable and Accurate

News of the Industry

PAGE 532 VOLUME 60 *Philadelphia, Saturday, October 13, 1928* NUMBER 15

October Operations Hold Close to Capacity Rate

PHILADELPHIA, Oct. 13—With the production of 460,000 cars and trucks in September indicated by the preliminary estimates, the total for the third quarter of the year is brought to about 1,365,500, the largest quarter the automotive industry has ever had. Total production in the first nine months is brought to approximately 3,687,000 as against 3,712,-984 in the same period of 1926, the record production year.

October operations are continuing at close to capacity rates and schedules for the early month show little change from September. This is due in part, however, to orders carried over from September by many companies and a declining rate is looked for as the month progresses. There is little question but that the 349,091 total in October, 1926, will be exceeded, and that the totals in the last three months of the year will carry 1928 to a new high record.

Increasing operations by Ford will have an important effect in carrying the year to a new high record. The company is now building upwards of 5500 daily in its United States and Canadian plants and all its assembly plants throughout the world are operating. The company built more than 100,000 vehicles in September and its orders are continuing several months ahead of production.

Motor Wheel to Build

LANSING, Oct. 10—Motor Wheel Corp. will soon start construction on a building 220 ft. square to house its wire wheel division and on a building probably 400 by 200 ft. to house all hub activities. Wire wheel capacity will be brought to 6000 daily. The building program includes also a die tool and machinery building. Operations will continue through October at capacity.

Reo Promotes Sales Heads

LANSING, Oct. 10—Three assistant sales managers have been appointed by C. E. Eldridge, sales manager of Reo Motor Car Co., as follows: Carl Parker in charge of Speed Wagon sales; E. G. Poxson in charge of territorial analysis, and R. G. Hudson in charge of Canadian and export sales.

Auto-Lite Acquires Interest in Eclipse

TOLEDO, Oct. 8—A substantial interest in the Eclipse Machine Co., Elmira, N. Y., has been purchased by the Electric Auto Lite Co., according to C. O. Miniger, president. No change in the Auto Lite capital structure was necessary to effect the purchase, he said.

"The purchase was made to protect the source of supply on a unit which is such a substantial part of our starting mechanism as the Bendix drive," said Mr. Miniger. No change in the present management of the Eclipse company is contemplated, he said.

Mergers Denied Between Murray, Marmon, Auburn

DETROIT, Oct. 9—C. W. Avery, president of the Murray Corp. of America, denied today that merger negotiations were being considered by Murray and the Marmon Motor Car Co.

CHICAGO, Oct. 10—E. L. Cord, president of Auburn Automobile Co., denied existence merger negotiations between his company and Marmon Motor Car Co. or any other concern in the industry.

Timken to Add Unit

CANTON, OHIO, Oct. 9—A second building expansion program will be started by the Timken Roller Bearing Co., at once. An addition to the shipping building also will be erected.

Fisher Ohio to Expand

CLEVELAND, Oct. 8—Fisher Body Ohio Co. will build 1,250,000 bodies for the 1929 Chevrolet, an increase of 250,000 over the output this year.

Car as Necessity Gave America Lead

NEW YORK, Oct. 10—Addressing the annual salon dinner of the American Automotive Club of Europe in Paris this week, Alvan Macauley, president of the National Automobile Chamber of Commerce, said that if the originators of the automotive industry in Paris had had the vision of the motor car as a utility rather than as a luxury, theirs might have been the world's markets today. The development of the car as a necessity in Europe in recent years is resulting in largely increased demand in which the American cars are getting a large share, he declared.

S.A.E. Arranges Program for Transportation Meeting

NEW YORK, Oct. 10—The complete program for the transportation meeting of the Society of Automotive Engineers, Oct. 17 to 19, at the Robert Treat Hotel, Newark, N. J., has been arranged. Among the speakers are Alfred Reeves, general manager National Automobile Chamber of Commerce; T. H. MacDonald, chief of the Bureau of Public Roads; A. F. Masury, International Motor Co.; F. C. Horner, General Motors Corp. Dr. Miller McClintock of the Erskine Bureau of Street Traffic Research, will talk at the dinner on Thursday evening.

Headlight Meeting Oct. 16

NEW YORK, Oct. 10—A demonstration meeting of headlighting equipment has been arranged by the headlighting research sub-committee of the Society of Automotive Engineers for Oct. 16 at the General Motors Proving Grounds.

Durez Sales at Peak

NORTH TONAWANDA, N. Y., Oct. 9—General Plastics, Inc., reports sales of Durez, its molding compound, in September as approximating its record figure set up in August.

New Citroen Models on 300 Daily Basis

New Equipment Worth $4,000,000, Mostly From U. S., Installed in 21 Days

PARIS, Oct. 6—Stopping production on Aug. 10 of the four-cylinder model he has been manufacturing for the last three years, Andre Citroen had his entire chain of factories in and around Paris in operation 21 days later on his new models, the four-cylinder C4, and the six-cylinder C6. During the period the factory was closed, 3000 machine tools changed position or were newly installed, 84 drop hammer and forges were put in place, and 50 new presses were mounted.

The new machinery, most of which has come from the United States, has a value of $4,000,000. Some of it was brought over on the fast passenger boats Paris and Ile de France, to gain time. The most important acquisition is the new American machinery for facing and boring cylinder blocks. Citroen claims that only two firms in America have a similar equipment.

Production of the two new models is now proceeding at the rate of 300 per day, but will reach 400 before the end of the present year. The factory is being organized for a production of 600 cars per day, but Citroen states that owing to the time necessary to install the new plant he probably will not get beyond 500 a day during the next six months. This will constitute the biggest production of any automobile factory in Europe.

German Registry Shows 351,380 Passenger Cars

BERLIN, Oct. 6—There were 351,380 passenger cars, 121,765 trucks and buses, 438,288 large motorcycles and 21,879 tractors registered in Germany on July 1, according to a report by the Association of German Automobile Makers. Compared with the figures of July 1, 1927, above figures mean an increase of 37 per cent in the aggregate, of 31 per cent for passenger cars, 21 per cent for trucks and buses, 47 per cent for large motorcycles and 37 per cent for tractors. One automotive vehicle falls to every sixty-ninth inhabitant, as against every eighty-seventh a year earlier.

There were 32,413 gasoline engines imported into Germany during the first half of this year. This figure already exceeds considerably the sum for the whole of last year, which was 29,878.

Sikorsky Reorganized

NEW YORK, Oct. 8—The Sikorsky Aviation Corp. has been organized to readjust the financial structure and take over the assets and business of the Sikorsky Mfg. Co. The new Sikorsky company will have a capital of 200,000 shares of no par stock, of which 100,000 shares are to be retained by the present management.

The new company has entered into a contract which gives Curtiss Flying Service, Inc., exclusive rights for the sale of Sikorsky planes for commercial use in the United States, and a similar contract for export has been entered into with Curtiss Airplane Export Corp.

Studebaker Builds Engineering Unit

SOUTH BEND, Oct. 10—Construction of a new unit of the South Bend plants to house engineering department offices and provide increased facilities for the research engineering laboratories, is announced by the Studebaker Corp. of America. When the new building is completed early in November, 161,000 sq. ft. of floor space will be available for Studebaker's new engineering headquarters. Removal of the laboratories from their present location was necessitated by the increased demand for space in the plants.

Another building for the handling of export shipments will also be built.

Willoughby Heads Branches

SOUTH BEND, Oct. 10—D. J. Willoughby has been appointed division manager in charge of Southern branches by the Studebaker Corp. of America. Mr. Willoughby is succeeded as manager of the Boston branch by G. E. Read, formerly Omaha branch manager.

Mullins to Increase Stock

NEW YORK, Oct. 10—A special meeting of stockholders of Mullins Mfg. Co. has been called for Nov. 1 to authorize an increase in common stock to 150,000 shares from 100,000 and to issue 30,000 shares of $7 cumulative preferred stock at 101. Proceeds of the preferred stock issue will be used to retire 9465 shares of 8 per cent preferred now outstanding and to provide working capital for expansion.

Chrysler Denies Stock Issue

NEW YORK, Oct. 10—Reports that the Chrysler Corp. was soon to offer 1,000,000 additional shares of common stock, the proceeds of which would be used to retire the funded debt of Dodge Brothers, Inc., and retire outstanding notes of the former Maxwell Motor Co., were denied by W. P. Chrysler, who said no such offer is imminent.

Willys Dealers to Sell Stearns

CLEVELAND, Oct. 10—Plans have been worked out for the distribution of Stearns-Knight cars by the larger dealers of the Willys-Overland Co. dealer organization. Overland organizations in Canada and Great Britain will also combine sales in those countries and the Willys-Overland Export Corp. will sell throughout the world.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for AUTOMOTIVE INDUSTRIES.

NEW YORK, Oct. 10—The dominant tone of trade is optimistic; and the volume is increasing, especially in those sections of the country that are enjoying cool and seasonable weather. The holding back of crops in anticipation of higher prices has, to some extent, curtailed purchasing power in certain farming districts; but the resort to this practice has been moderate.

CHAIN STORE SALES

Sales of twenty-three leading chain stores increased 23.2 per cent in September, as compared with last September. A considerable part of this increase is the direct result of a policy of expansion, both in the acquisition of new stores and in the addition of new departments in the old ones.

FREIGHT CAR LOADINGS

Car loadings for the week ended Sept. 22 totaled 1,143,214 cars, showing an increase of 4902 cars over the preceding week and making a new high for the year.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Oct. 6 was 99.2, which compares with 99.3 the week before and 99.8 two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended Oct. 3 showed an increase of 7 per cent over those in the corresponding week last year.

STOCK EXCHANGE

During the earlier part of last week the stock market was weak, but the reduction in the rate on call money from 10 per cent to 6½ and 6 per cent in the latter part of the week brought with it a recovery.

FEDERAL RESERVE REPORT

The report of the Federal Reserve member banks for the week ended Oct. 3 showed an increase of $143,000,000 in loans and discounts and a decrease of $101,000,000 in investments. The combined statement of Federal Reserve banks for this period showed increases of $15,200,000 in holdings of discounted bills, $46,600,000 in bills bought in the open market, and $1,600,000 in holdings of United States Government securities. In the New York district alone, holdings of discounted bills increased by $16,400,000.

Driver-Harris Sustained

NEW YORK, Oct. 8—Driver-Harris Co. has been sustained in Federal Court here in its suit against Hardite Metals, Inc., for making and selling carburizing containers infringing upon patent rights held by the Driver-Harris company. An accounting and injunction was directed.

3 Companies Merge in Allied Products

Indiana Lamp, Victor Peninsular and Richard Brothers in New Combination

CHICAGO, Oct. 6—Formation of the Allied Products Corp. in Illinois to acquire the businesses of the Indiana Lamp Corp., Victor-Peninsular Co., and the Richard Brothers Die Works, organized in 1910, 1917 and 1915 respectively, was announced today by John Burnham & Co., investment bankers, in circulars offering 50,000 shares of Class A convertible common stock in the new corporation.

The company's authorized capitalization consists of 50,000 shares of Class A convertible common, no par value, of which 50,000 shares are issued; and 125,000 shares of common stock, no par value, of which 75,000 shares are issued. Fifty thousand shares of common stock are reserved for the conversion of the Class A convertible shares.

The new corporation will continue the manufacture of all types of lamps for automobiles including headlights, side lights and tail lights at Connersville, Ind., where it is also the exclusive producer of the Ilco-Ryan-Lite. Special dies, interchangeable dies and punches, cap screws, shackle bolts and similar products are manufactured at Detroit and Hillsdale, Mich. Approximately 80 per cent of the company's products are purchased by the automotive industry.

Placing only a nominal value on patents, the pro forma balance sheet of the corporation as of March 31, 1928, adjusted to give effect to the present financing, shows total net assets of $4,240,000, net current assets of $1,200,000 and book value of Class A convertible common stock of more than $84 per share. The Class A stock is convertible share for share into common.

Net sales of the corporation for the three months ended March 31 were $1,630,290 and net profits were $224,981. The figures for six months without audit show sales of $3,400,000 and net profits of more than $450,000.

R. O. Cunningham President

R. O. Cunningham has been named president of the new corporation and the company states that those who have been responsible for the successful development and operation of the three businesses in the past, will continue in the active management. The bankers will have representation on the board of directors, which will include R. O. Cunningham of Ford, Bacon & Davis, Inc.; J. F. Towers, vice-president of Ford, Bacon & Davis; R. M. Heams, formerly vice-president of Victor-Peninsular Co., Detroit; O. K. Richard, formerly co-owner of Richards Brothers Die Works, Detroit, and W. F. Thoms, formerly president of the Indiana Lamp Corp., Connersville.

Ford Building 5500, All Plants Working

DETROIT, Oct. 8—Production of cars and trucks was at the rate of 5500 per day during the first week in October, Ford Motor Co. reports. Every Ford assembly plant in the world was in operation on Oct. 1 and indications are that the next few months will see the previous Ford record of 8500 cars daily established in 1926, surpassed by the production rate of the new Ford cars and trucks.

More than 100,000 of the new model Ford cars and trucks were manufactured and sold in the United States and Canada during September. Since the first of the year approximately 500,000 Model A cars and Model AA trucks have been built and distributed.

G.M. Truck to End Excessive Trade-Ins

PONTIAC, Oct. 8—Excessive trade-in allowances will no longer be made on General Motors Trucks.

Throughout the nation-wide organization of 42 General Motors Truck branches, Mr. Arnold explained, arrangements have been perfected for a practical and thorough system of appraising used trucks at their actual resale market worth. This appraisal will in every case be the judgment of several men experienced in local market conditions, for used and reconditioned equipment, and will in every case safeguard the true interests of the truck owner and buyer, he declared. No allowances will be made, in any case, above the accurate appraisal figure.

Stout Continues With Ford

DETROIT, Oct. 6—Officials of Ford Motor Co. have denied accuracy of published reports that relations between the company and William B. Stout had been broken off. Officials of Ford explained that no dispute has occurred between Stout and Ford officials over government orders for tri-engined planes as published locally.

Oakland Shipments 19,113

DETROIT, Oct. 6—Oakland Motor Car Co. delivered 19,113 cars in September, bringing shipments for the first nine months of the year to 225,879, compared with 160,554 units in the corresponding period of last year.

Kissel Gets Style Award

HARTFORD, WIS., Oct. 8—For the second time this year Kissel motor cars have received high honors in style and beauty contests held in Germany.

Six States to Vote $300,000,000 Bonds

Will Provide Early Road Work if Favored in Coming Elections

NEW YORK, Oct. 6—Voters in six states will be called upon in the coming election to pull their highways "out of the mud," according to Roy D. Chapin, chairman of the highway committee of the National Automobile Chamber of Commerce in his report read before the members' meeting this week. Highway bonds, totaling $330,000,000 are proposed in these various states, to be expended for the immediate completion of state highway systems. In addition to these projects there are movements on foot in five or six other states looking to the issuance of more than $500,000,000 in bonds in highway improvements, according to Mr. Chapin.

Iowa heads the list with a call for a $100,000,000 bond issue to retire a $60,000,000 issue now standing and to surface additional roads, with the expectation of hard surfacing some 4800 miles and graveling another 1800 miles. Missourians will be called upon to vote an issue of $75,000,000 to complete surfacing its state system and to widen roads in special metropolitan areas. Colorado is calling for $60,000,000; Pennsylvania for $50,000,000; West Virginia for $35,000,000, and California for $10,000,000.

In commenting on the situation Mr. Chapin said: "Strong sentiment seems to prevail too as to the advisability of saving 5 to 10 years in the completion of the state system by means of the bond method. The result is actually a 'pay-as-you-go' plan but with the roads actually in service. The experience of states like North Carolina, where bonds were issued to pay for the state system, contrasts most favorably with other states where the fallacious doctrine of 'pay-as-you-go' in the ordinary sense still maintains. In those instances the motorist too often pays without going."

Illinois Paves 70 Miles in Week

CHICAGO, Oct. 8—A world's record in pavement building was recently established by Illinois when in one week 70.68 miles of concrete pavement were laid, state highway records show. These roads are 18 and 20 ft. wide. This mileage exceeds the previous best week's construction by more than seven miles.

George E. Hall

BOSTON, Oct. 6—George E. Hall, for the past 12 years president and general manager of the Boston Woven Hose & Rubber Co., died from heart trouble at Osterville, Mass., Oct. 3. Mr. Hall was born in Brattleboro, Vt., Aug. 2, 1868. He joined the Boston Woven Hose & Rubber Co. in 1907, being elected president of the organization in 1916.

Iowa Ton-Mile Tax is Upheld by Court

Rules Operators of Trucks Between Fixed Points Are Subject to Law

DES MOINES, Oct. 6—The Supreme Court, in a decision involving legality of the ton-mile tax upon motor truck carriers in the state, sustained constitutionality of the motor carrier law and ruled that operators of trucks between fixed termini must pay the tax. Members of the Iowa Motor Vehicle Association, a group led by the Red Ball Transportation Co., of Mason City, which is indebted to the state $48,000, are liable for approximately $62,000 in taxes and penalties under the court ruling, Charles Webster, chairman of the state railroad commission, said.

Appeal was taken from the decision of Judge W. G. Bonner in the Polk County district court and the Supreme Court opinion was concurred in by the entire court. The bus operators attacked the law on the ground that it was discriminatory in that farmers and merchants were permitted use of the highways to haul and deliver produce but exempt from the tax.

Another opinion of the Supreme Court sustained the commission's right to enforce its rules and regulations against operators in reevrsing the finding of a Woodbury county judge who refused to issue injunction against W. J. Holdcroft, a bus operator, who persisted in operating after the commission had rejected his petition for a permit. The lower court held that Holdcroft was liable only for a misdemeanor and subject to fine but the Supreme Court held error in that finding and ruled that injunction should issue.

Albertson to Build

SIOUX CITY, IOWA, Oct. 6—Albertson & Co., manufacturer of automotive tools, has begun construction upon its new $60,000 addition, west of the present plant, which will be 40 x 155 ft., with four floors and basement. It will be reinforced concrete construction and is scheduled to be fully equipped and in operation by Feb. 15. Business of the plant has been growing so fast that double shifts have been employed in recent months in effort to maintain production demands.

Japan Market Active

WASHINGTON, Oct. 6—An active automotive market is reported in Japan, in cabled advices to the Department of Commerce from Tokyo. Interest there is reported centered on numerous bus projects. The rapid increase of automobiles in Japan has resulted in the Tokyo police bureau issuing an elaborate code of regulations numbering 107 articles, covering operation of automobiles.

Goes With Chrysler

Leroy G. Peed, sales manager of Willys-Overland since 1922, who has taken service under the Chrysler banner

Brake Lining Association Numbers Clutch Facings

NEW YORK, Oct. 8—The Asbestos Brake Lining Association is developing a standardized numbering system for clutch facings in conformance with the resolution adopted at the last meeting. According to this system all facings for a particular type of clutch, regardless of by whom the facing is made, will bear the same number. It is also the plan of this association to establish uniform list prices for this clutch facing, leaving to the individual manufacturer, however, the question of trade discounts. The new list will be in effect by Jan. 1, 1929.

Gardner Increases 79%

ST. LOUIS, Oct. 6—An increase of 79 per cent in September production as compared with September last year has been scored by Gardner Motor Co. "September orders made it necessary to carry forward into October more business than was done in the entire month of October, 1927," said F. W. Gardner, executive vice-president. Production in the month set a new record and the company enters the fourth quarter with the brightest outlook in its history, Mr. Gardner said.

Adds New Tractor Model

BIG RAPIDS, MICH., Oct. 6—Four-Drive Tractor Co. of this city has recently brought out an additional model of four-wheel-drive tractor, known as Model E, which it will manufacture with its Model D which has been on the market for the last fourteen years. Model E has a rating of 15-30 hp., while that of the older Model D is 25-30 hp. The price on Model D has been lowered from $3,000 to $2,650, while the price of Model E has been set at $1,495.

Peed Leaves Willys for Chrysler Post

Joins Successor to Maxwell With Which He Gained Early Training

DETROIT, Oct. 6—Appointment of L. G. Peed, formerly sales manager of the Willys-Overland Co. to an important executive position in the Chrysler Corp., was announced today by J. E. Fields, vice-president in charge of sales. Mr. Peed was for 10 years associated with the old Maxwell Motor Co., and for the past 11 years has been with the Willys-Overland company in various sales capacities. Mr. Peed's first commercial experience after leaving school was in the New Castle plant of Maxwell. Coming to Detroit he progressed through the Maxwell organization.

In 1917 he was offered the position of sales manager of the Willys-Overland New York branch. In 1919, after his return from war service, he was made assistant zone manager of the eastern division of Willys-Overland. In 1921 he became manager of the Toledo branch. In 1922 he was appointed assistant sales manager at the factory, and worked under the leadership of Walter P. Chrysler with whom he again joins forces. In November, 1922, he became Willys-Overland sales manager, which position he filled to the date of his resignation.

Brown Unfilled Orders $1,000,000 in Quarter

DETROIT, Oct. 6—John W. Brown Mfg. Co. started the final quarter of 1928 with unfilled orders in excess of $1,000,000, including a large initial order from the Chrysler Corp. During the final quarter of the year it will be necessary for the Brown company to run overtime to fill orders.

The company has deposited with the trustee money to retire the balance of its bonded indebtedness and is carrying cash in bank and government securities in excess of $500,000, against current liabilities not exceeding $175,000. Including accounts receivable, the company shows a current ratio of approximately 4½ of quick assets to 1 of current liabilities.

The retirement of the bond issue leaves the company with no capital obligation outside of the 100,000 shares of common stock of the par value of $10, on which it is officially estimated that the net earnings for 1928 will equal $6 per share.

Overland Sales 75,000

TOLEDO, Oct. 6—Sales for Willys-Overland Co., in the third quarter were approximately 75,000 cars as compared with 39,000 in the same period last year. Export trade holds up well and sales volume has been increasing in the last two weeks of September. The factory is operating night shifts.

Men of the Industry and What They Are Doing

Mortensen and Barnum Get Cutler-Hammer Posts

N. L. Mortensen has been appointed chief engineer for the Cutler-Hammer Mfg. Co., Milwaukee. T. E. Barnum, former chief engineer, has been appointed consulting engineer for the company, in which position he will be able to give uninterrupted attention to engineering problems and outside engineering relations.

Mr. Mortensen has been connected with Cutler-Hammer for 21 years, the last five of which have been as assistant to Mr. Barnum. Born in Denmark, he received his technical education there and in Germany.

Articles by him have appeared frequently in the technical press and he has delivered numerous papers before electrical societies. He is a fellow of the A.I.E.E. and a member of the A.I.S.E.E.

G.M.A.C. Adds 3 Vice-Presidents

General Motors Acceptance Corp. held its annual meeting of branch managers at the Hotel Biltmore, New York. There were 250 delegates and guests from all over the world. Following the business sessions a dinner dance was held in the hotel at which the board of directors announced the election of three new vice-presidents, J. I. Burnhams, A. Freise and George J. Benkhart.

Kull Gets Reo Appointment

A. E. Kull has been named sales promotion manager of the Reo Motor Car Co. and will assume his duties Nov. 1. This is a newly created position. Mr. Kull has been manager of the Reo-Kull Motor Co. of Oklahoma City since January, 1927, and has been with Reo six years.

Foote Appoints Tischer

CHICAGO, Oct. 9—Foote Bros. Gear & Machine Co. has appointed A. H. Tischer, Indianapolis, to represent them in the Indiana territory south of the line drawn below the city of Fort Wayne, Ind., and also including the city of Louisville, Ky.

Hildorf Joins Timken Steel

Effective Oct. 15, Walter G. Hildorf will be placed in charge of all metallurgical work for the Timken Steel & Tube Co., Canton, Ohio. For the past several years Mr. Hildorf has been metallurgical engineer for the Reo Motor Car Co.

Erdman Heads N. Y. Branch

W. K. Erdman, formerly division manager of Eastern branches of the Studebaker Corp. of America, has been appointed manager of the New York retail branch, succeeding E. J. Murnane who has resigned.

Hennecke to Direct Hollingshead Sales

Earle V. Hennecke has joined the R. M. Hollingshead Co., manufacturer of Whiz products, Camden, N. J., as vice-president. Under Mr. Hennecke's direction the products of the company are expected soon to be distributed nationally through jobbers. Mr. Hennecke will continue to supervise the operation of his own company in New York.

Huffman on Western Trip

Russell Huffman, of the legislative committee of the National Automobile Chamber of Commerce, is visiting local organizations functioning under the Motor Vehicle Conference Committee throughout the Western States. His itinerary will cover Chicago, Minneapolis, Fargo, Pierre, Sioux Falls, Cheyenne, Salt Lake City, Pocatello, Boise, Helena, Butte, Seattle, Portland, San Francisco, Reno, Los Angeles, Phoenix, Grand Canyon, Sante Fe and Albuquerque.

Eaton Heads Detroit Sales

Arthur G. Eaton, recently elected a vice-president and sales director of Aluminum Industries, Inc., Cincinnati, will be in charge of the company's new general sales offices in the Fisher Bldg., Detroit. Mr. Eaton formerly was director of purchases of Dodge Brothers, Inc. Associated with him in the Detroit office will be B. J. Plumley.

Brockway Names Officials

George S. Piroomoff has been appointed technical assistant to the president of Brockway Motor Truck Corp., and Norman S. Roblee has been appointed vice-president and sales manager of Indiana Truck Corp. Mr. Piroomoff will be located at New York headquarters, and Mr. Roblee at the Marion, Ind., offices.

Locomobile Promotes Moriarty

George H. Moriarty, who for more than a year has been stationed in Los Angeles, has been appointed assistant general sales manager for the Locomobile Co. of America, Inc. He recently departed for Bridgeport, Conn., to assume his new duties.

Young Accepts Commission

Fred M. Young, president of the Young Radiator Co., Racine, has accepted a commission of captain in the specialist reserve, air corps, U. S. Army.

Sees Shorter Wheelbases Adding Miles in Cities

Pointing out that a reduction of five inches in the wheelbase on all cars using New York City streets will be equivalent to 55 miles of city streets, Ernest H. Miller, president of the Yellow Taxi Corp., of New York, who returned last week from a trip to Europe, said that he believed shorter wheelbases would be necessary in order to cope with traffic conditions. He says that traffic is handled much better in Paris, where the average wheelbase is not over 110 inches. This gives, in his estimation, not only the possibility of putting more cars into a given block but also gives each car greater maneuvering ability.

G. M. Export Men on Trips

E. S. Zack, general treasurer of General Motors Australia, arrived in New York Oct. 3, from Melbourne, and will remain at the home office for several weeks pending a new assignment. F. W. Macomber, general inspector of General Motors Japan, sailed Oct. 11 from Vancouver for Osaka. Donald Bay, sales manager of General Motors New Zealand, after an absence of nearly three years, returned to the home office Oct. 8 for a vacation and visit to the General Motors factories and proving grounds. Frank Phillips, manager of the Honolulu branch, arrived in New York Oct. 8 for a vacation and new assignment.

Espenhain Joins Fisk

Frank K. Espenhain, formerly first vice-president of the Goodyear Tire & Rubber Co., has been appointed executive vice-president of the Fisk Rubber Co., Chicopee Falls, Mass., and began his duties Oct. 1. Mr. Espenhain was with the Goodyear organization seven years, and previous to that was an export representative in New York for several companies.

Woodin Heads Research

William H. Woodin, Jr., son of the head of the American Car & Foundry Co., and the American Locomotive Co., has been appointed director of research of the American Car & Foundry Co. and will give special attention to the company's expansion into the bus and cruiser building field.

Give $135,000 to Toledo "Y"

Clement O. Miniger, president of the Electric Auto-Lite Co., has given $100,000 for the expansion program of the Young Men's Christian Association at Toledo and is working as chairman of special gifts. Robert and Frank Stranahan of the Champion Spark Plug Co., have also announced a gift of $35,000 for their company.

Nash Quarter Net Totals $6,666,853

Sales of 52,695 Show Increase of 10,000 Over Same Quarter in 1927

CHICAGO, Oct. 9—Earnings of Nash Motors Co. in the third quarter of its fiscal year, covering June, July and August, was $6,666,853, equivalent to $2.44 a share. Earnings in the same quarter in 1927 were $6,298,524, or $2.31 a share. Directors declared the regular quarterly dividend of $1 a share and an extra dividend of 50 cents a share.

Sales of the new "400" cars during the quarter totaled 52,695, an increase of more than 10,000 units over the same quarter last year, and 22½ per cent over the best previous quarter in the company's history. Stocks of new and used cars in dealers' hands were reported low and sales are expected to continue high through the fourth quarter.

M. H. Pettit, vice-president and general manager, said the cost of getting into production on the new models had reduced earnings in the quarter but that they were in line with the expectations of the company.

Convertible Body Models Introduced by Chrysler

DETROIT, Oct. 8—Two convertible body models have been added to its "75" line by the Chrysler Corp. They consist of a phaeton sedan listing at $2,245 and a convertible coupe listing at $1,695. On the phaeton sedan the four front pillars are integral with the body, rear pillar top bows and side pieces folding back to be covered with a boot extending out over the back of the body when used as a phaeton. Front compartment windows are crank-operated while rear windows are either locked on the doors or are swung forward and locked to the back of the front seat to serve as a turnover windshield. Included in the standard equipment is a folding center arm rest for the rear seat and non-shatterable glass for the windshield.

Radiator core fenders and other exposed chassis parts of the convertible coupe are finished in black, body color being sable. The rear body pillar folds down with the top. Door frames, landau irons and door handles on both models are chrome plated. Windshield glass is non-shatterable. Wire wheels are optional at extra cost.

Vought Shipments Rise to $410,000 in September

LONG ISLAND CITY, Oct. 8—Chance Vought Corp. shipped airplanes and spare parts valued at $410,000 in September. This exceeds by 35 per cent the former monthly record. Also a new record for quarterly shipments was made when planes and parts valued at $950,000 were delivered by the Vought plant during the third quarter. This is a 300 per cent gain over the similar period of 1927, and also exceeded, by a small margin, the shipments for the entire first six months of 1928.

Though shipments are being made at the annual rate of $5,000,000, it has been necessary to put on a night shift at the Vought plant in order to meet the rapidly increasing demand.

German Club Men Here for Three Weeks' Tour

NEW YORK, Oct. 9—One hundred and thirty-one members of the Allgemeiner Deutscher Automobil Club arrived Saturday on the S. S. Muenchen for a three weeks' tour of this country under the auspices of the American Automobile Association. Monday and Tuesday of this week were spent in visits in and around New York as guests of the automobile association, after which they will visit Philadelphia, Washington, Columbus, Cincinnati, Indianapolis, Chicago, Detroit, Hamilton (Ont.), Nigara Falls and Binghamton. This tour will be made entirely in the Yellow Cab & Coach Company's buses. The delegates consist of prominent business men, educators and manufacturers of Germany who are interested in one way or another in motoring.

Musselman N.S.P.A. Speaker

DETROIT, Oct. 9—C. A. Musselman, president of Chilton Class Journal Co., will speak at the trade press dinner given by the National Standard Parts Association, in Cleveland, Oct. 28, preceding its convention, Oct. 29 to Nov. 2. Speakers at the convention sessions include J. D. Carson of N. W. Ayer & Son; Dr. Hugh P. Baker, U. S. Chamber of Commerce; Chester Leasure, editor of Nation's Business; John E. Echlin, Tom Duggan, W. E. McIlroy, R. A. Kiken and L. T. White, president of the N.S.P.A.

McCord and Warner Speak

PHILADELPHIA, Oct. 10 — The Pennsylvania Section of the Society of Automotive Engineers held its monthly meeting last night with Commander McCord, of the naval aircraft factory, and E. P. Warner, assistant secretary of the Navy for aeronautics, as speakers. The meeting was presided over by J. H. Geisse, chief engineer, aeronautical engine laboratory, naval aircraft factory.

To Offer New Piston

CINCINNATI, Oct. 8 — Aluminum Industries, Inc., is soon to offer a new type aluminum piston under the Permite trade mark. The company has increased its plant capacity by the addition of a new building costing $75,000.

Ford Adopts Bendix Drive

DETROIT, Oct. 9—Ford Motor Co. has adopted the Bendix type starter drive and is now equipping all its production. Former types and parts affected are obsoleted.

Financial Notes

Fairchild Aviation Corp. stockholders have been called for a special meeting Oct. 15 to authorize an increase of stock to 560,000 shares, to consist of 500,000 shares of Class A and 60,000 Class B stock. It is planned to change the present 150,000 shares of Class A stock into 300,000 shares of new Class A stock and the 30,000 shares of present Class B stock into 60,000 shares of new Class B stock. Stockholders also will be asked to ratify the sale of 85,000 shares of new Class A stock to bankers at such prices as may be fixed by the directors.

Universal Products Co. has secured contracts for additional business in excess of $1,000,000 a year. The company is operating at capacity and entered October with a record volume of unfilled orders. For the first eight months of 1928 the company earned net profit of $338,461, after all charges and Federal taxes, equivalent to $4.23 a share on the 80,000 shares of common stock outstanding. Net for the eight months was larger than that for the entire year 1927, when earnings were $229,907, or $2.78 a share.

A. O. Smith Corp. reports net income of $2,833,700 for the year ended July 31, equivalent after 7 per cent dividends on preferred stock and sinking fund reserve for preferred stock retirement, to $4.57 a share earned on 500,000 no par common shares. This compares with $3,656,962 in the preceding year, or $24.78 a share.

Waukesha Motor Co. reports net income for the year ended July 31 as $1,169,867 after charges and Federal taxes, equivalent to $11.69 a share on 100,000 shares of no-par stock, and comparing with $780,530, or $7.80 a share in the preceding fiscal year. Current assets on July 31 were $33,171,641 and current liabilities $645,523 as against $2,228,313 and $490,525 on July 31, 1927.

Goodyear Tire & Rubber Co. has given stockholders the right to subscribe to additional shares of common stock at $50 a share in the ratio of one share of new for every four held. It is expected by this plan to raise about $10,000,000, which will be used in the expansion of manufacturing facilities of the company.

Ross Gear & Tool Co. earnings for the first nine months of this year, after allowing for Federal taxes, amounted to $637,630. This is equal to $4.25 per share on the 150,000 shares of stock outstanding. Earnings for the first nine months of 1927 were $334,730.

Kelly Springfield Tire Co. has approved a plan to give stockholders one share of no par stock for each share of $25 par stock now held, and the right to subscribe for an additional 700,000 shares of common stock at $21 a share.

Collins & Aikman Corp. report net profit for the six months ended Aug. 31, after all charges, as $927,593. This is equivalent to 87 cents a share on common stock.

Backstay Welt Co. reports net income of $262,175 in the first eight months of 1928, this comparing with $230,901 in the full year 1927.

Graham-Paige Forms German Corporation

Will Assemble and Sell Throughout Germany—Will Use German Bodies

DETROIT, Oct. 6—Graham-Paige Automobil g.m.b.h., a German corporation organized to operate an assembling plant and to distribute Graham-Paige cars throughout Germany, will begin operations shortly at Johannisthal, where a modern plant having 57,000 sq. ft. of floor space has been acquired. Johannisthal is an industrial suburb of Berlin, 18 miles from the capital. The plants of several other automobile manufacturers are there, as is also Ambi-Budd Presswerk, the German plant of the Edward G. Budd Mfg. Co.

Baron Edgar von Spiegel, general manager of the new plant, was the first Paige distributor in Germany, having been appointed Oct. 16, 1924, and has been connected with Paige and Graham-Paige in Germany continuously since then.

S. M. Berg and Hans Wollner, experienced engineers and layout men, have been sent to Berlin by the Detroit factory to make a thorough survey of the manufacturing, assembling and export possibilities of the Johannisthal plant. The buildings will be laid out to assemble Graham-Paige chassis on the American system of continuous production and to receive bodies built in Germany under Graham-Paige supervision. It is expected that the manufacturing and assembly plants will be completed shortly, and that volume production will be attained by the early spring of 1929.

To Distribute Through Duluth

DULUTH, MINN., Oct. 6—Cheaper freight rates made available by the shipment of automobiles on lake freighters operated by the Western Transit Co., Minnesota-Atlantic Transit Co. and the Great Lakes Transit Corp., has found another automobile manufacturer taking advantage of them.

The Graham-Paige Motor Car Co. has announced that territory headquarters have been established in Duluth in charge of the Duluth Motor Co. which has just started operations. The territory which the Duluth office will serve consists of western Wisconsin, the entire state of Minnesota, North Dakota, eastern Montana, and South Dakota. The automobiles will be shipped to Duluth by boat, and distributed by the territory office in Duluth. Gerard Spencer is manager.

De Soto Near 500 Daily

DETROIT, Oct. 8—Production of the Chrysler-built new De Soto Six reached nearly 500 cars a day by the end of September, C. W. Matheson, De Soto vice-president in charge of sales, reported.

Mexico to Support Pan-American Road

MEXICO CITY, Oct. 6—Pledging the support of the Mexican Government toward the construction of a Pan-American Highway, Luis Montes de Oca, secretary of Finance, told the delegates to the Second Mexican National Highway Congress and Exposition that it would not be more than three years before such a highway could be completed. "Conditions in Mexico are better than they have been for many years," he declared.

Murray Stock Increase to Retire Funded Debt

DETROIT, Oct. 6—A special meeting of stockholders of the Murray Corporation has been called for Nov. 15, to vote on increase in authorized capital stock to 900,000 shares of no par from 300,000. It is proposed to issue 269,300 shares of additional stock at $15 a share in ratio of one new share for each share held.

Harold O. Barker, newly elected chairman of the board, issued the following statement: "Proceeds from sales of this additional stock to shareholders will be used to retire about $4,000,000 of funded debt, leaving 539,666 shares of stock as the sole outstanding capital liability. Subject to approval of stockholders we propose to offer rights to subscribe to stockholders of record Nov. 16. Rights offer will expire on Dec. 20.

After retirement of outstanding bonds company will have between $7,500,000 and $8,000,000 of net working capital. The company has practically completed an expansion program which will increase body making capacity from 425 bodies to about 900 bodies a day. All divisions at the present time are operating at capacity.

Packard Shipments Up 53%

DETROIT, Oct. 6—Packard Motor Car Co. in the last nine months shipped 37,033 against 24,124 cars in the same period, 1927, an increase of 53 per cent. The October schedule, estimated at better than 5000 cars, will set a record. Securities of the company have reached new highs in the last few days on the stock market.

Henry P. Williams

CHICAGO, Oct. 6—Henry P. Williams, 69, founder and chairman of Williams & Cunnyngham and a pioneer in the Chicago advertising field, died yesterday at the Homestead Hotel in Evanston. Mr. Williams at one time was a member of the editorial staff of the Chicago Herald and later was city editor of the Daily News.

Durant and Amilcar Arrange Sales Deal

Will Sell Products in France and U. S. Under New Combination

NEW YORK, Oct. 8—W. C. Durant, president of Durant Motors, Inc., has cabled from Paris that he has closed a deal with the Amilcar Co. of Paris which gives the Durant car immediate representation in France. The entire manufacturing and sales organization of Amilcar with 135 dealers is now at the disposal of Durant Motors, Inc. Durant Motors will control the manufacture and sale of Amilcar in the United States.

This combination of French and American manufacturers is first of its kind. Amilcar makes small eight and six-cylinder lines which for several years past have built reputations for speed, performance and endurance. Amilcar won the 200-mile race at Brooklands this year, also the Grand Prix at Rome and on Sept. 2 broke eight international records at Paris.

Peerless Exports Increase

CLEVELAND, Oct. 8—Shipments of Peerless motor cars to foreign countries for September showed a 71 per cent increase over August and an increase of 108 per cent over September, 1927. Total foreign shipments this year to date show an increase of 48.8 per cent over the same period last year. These figures do not include Canadian sales, which also show a healthy increase for the year to date, according to R. N. Mosher, general sales manager of Peerless Motor Car Corp.

Finland Sales Increase

WASHINGTON, Oct. 6—Popularity of American made motor cars in Finland is attested by the reports of the registrations at the close of June, forwarded the Department of Commerce from Helsingfors, showing a total of 20,677 passenger cars, of which 18,653 were of American make, the whole figure being an increase of 3272 passenger cars over Dec. 31 last, all the additional cars being American made except 100. Buses showed an increase of 105 since December, 93 being American made.

Greece Favors U. S. Cars

WASHINGTON, Oct. 11—Approximately 70 per cent of the motor vehicles imported into Greece during the first six months of 1928 were of United States manufacture, according to reports received by the Department of Commerce. A total of 795 motor vehicles were imported, of which 555 were from the United States; 129 from France; 38 from Italy and the remainder scattered among manufacturers of other countries.

Parts Makers Price 1st Quarter Steel

Outlook for Continued Activity in 1929 Seen in Early Buying Moves

NEW YORK, Oct. 11—Indicative of a promising outlook for steel market activities in the first quarter of 1929 is the interest shown by parts makers in the attitude of sheet producers regarding prices for that quarter. Approach of the turn of the year heretofore has usually meant the shelving of new year commitments as long as possible, and it is rather striking that consumers should be thinking of their January and February steel requirements early in October.

Much has been made during the upward readjustment of prices (which, so steel producers say, has not yet been completed) of sellers taking into consideration the commitments of their customers. Steel producers know that parts makers have to figure close, and a rise in raw material prices, after the parts maker has booked a contract, is apt to wipe out what narrow margin of profit he calculated. A spirit of "give and take" was in evidence in adjusting steel prices, so as to bridge over these difficulties as much as possible, and having found this conciliatory attitude the line of least resistance, it will in all probability continue with reference to 1929 contracts.

It is not at all impossible that the second half of the current quarter will witness a slowing down in the demand for prompt shipment and the more consumers anticipate their first quarter 1929 requirements, the easier will be the period of transition.

Market gossip has it that a manufacturer of low-priced motor cars has been showing determined resistance to the new terms governing cash discounts. While there was some fault-finding with this change in terms on the part of jobbers, it may be said to have met with the acceptance of steel buyers as a whole. Coming at a time when sellers had the upper hand in the market, it is generally looked upon as the most painless way for improving the position of producers.

Sheet rollers are holding firm to 2.75 cents for black, 2.00 cents for blue annealed, and 4.00 cents, Pittsburgh, for full finished automobile sheets. The strip-steel market is steady. Cold-finished steel bars are now held firm at 2.20 cents, Pittsburgh. Automotive alloy steel rules firm.

Pig Iron—Demand for foundry and malleable iron continues fair, with the Michigan price $18 to $18.50. The Valley market for foundry iron is on a $17 basis, with malleable 25 @ 50 cents higher. Blast furnace interests predict a 50-cent per ton in advance in first quarter 1929 prices.

Aluminum—London information is to the effct that the European aluminum cartel has been extended until Oct. 1, 1931. Demand from automotive consumers continues good, with prices seemingly well maintained for both virgin and remelted grades.

Copper—Producers are apparently determined not to jeopardize the higher price ground attained in the last buying movement by risking further advances which might lead to overproduction and possibly a revival of speculative interest. While producers pick their customers these days, confining sales to legitimate consumers, distribution is so broad that here and there a consumer might be tempted to sell part of his reserves, if the price advance warranted such a maneuver. Demand for automotive brasses is on the uptrend.

Tin—After having advanced to 50 cents, the Straits tin market turned a shade easier. Every dip appears, however, to be followed by a rally in London.

Lead—Steady, with storage battery manufacturers buying in a routine way.

August Automotive Exports of $48,765,552 Bring Eight Months' Total to $357,000,000

WASHINGTON, Oct. 11—With more than $48,760,000 in automotive products exported during August from the United States, shipments from the United States for the January-to-August period totaled more than $357,000,000 in value or about $70,000,000 more than during January-August of 1927, the Department of Commerce announces.

The automotive export trade continued to show the steady increase over 1927 that has been evident throughout the 1928 period. August shipments of automotive products in 1928 amounted to exactly $48,765,552 as compared with $34,245,036 in August, 1927, an increase of 42.4 per cent. In addition, the August figures were greater than those of July, 1928, by approximately 4.8, the July shipments being valued at $46,525,449.

The increase in value of the products shipped was accomplished in spite of a decrease in the total number of units shipped as compared with July. In July 51,670 units were sent abroad as compared with 48,207 units in August, a decrease in number of units of about 7.2 per cent. The decrease occurred in passenger cars shipped—38,880 in July, and 32,015 in August, about an 18 per cent drop—trucks having increased in number in shipments in August when 16,192 were shipped as compared with 12,790 in July. The outstanding development therefore was the increase in the average value per unit shipped in August over July, passenger cars on an average being valued at $704 as compared with $608 in July and trucks being valued at $625 in August as compared with $635 in July.

Argentina and Australia were best customers for passenger cars with Canada, Brazil, Belgium and British South Africa following in the order named. Australia was the best customer for trucks in August, Argentina being second, Brazil third, and Canada fourth.

700 Fleetwoods Ordered

DETROIT, Oct. 9—Orders for more than 700 cars with Fleetwood custom-built bodies totaling in value more than $3,500,000 have been received by the Cadillac Motor Car Co., following the announcement of the new cars late in August. Actual shipment of Fleetwoods for the same period are three times as great as in the same period one year ago. The output for the year is expected to exceed the peak figures of the 1927-28 season by 50 per cent.

Wolseley Lowers Prices

WASHINGTON, Oct. 11—Coincident with the announcement that automotive sales had increased slightly in September in England, cable advices received by the Department of Commerce state that several additional British manufacturers of automobiles had reduced prices, the largest reductions being on the Wolseley six-cylinder sedan, which ranged from $600 to $1,600.

5-Speed Transmission to be Made by Cotta

ROCKFORD, Oct. 6—Capitalization of the Cotta Gear Co. has been increased from $30,000 to $200,000 to provide increased facilities for the manufacture of a new five-speed transmission, it was announced last week by Charles Cotta, president and inventor of the new transmission. The reorganization includes George F. Colton, president of the Crumb-Colton Co., as secretary. L. P. Cotta is treasurer of the company. Mr. Cotta, who has been associated with the transmission and gear business, since its earliest years, organized the Cotta Gear company in 1913 and two years later it completed the plant it now occupies. Capacity of the plant, it is expected, will be tripled within a year.

The new transmission will be designed for trucks and buses from between five to seven tons and also for rail cars. It is the only transmission on the market providing for five speeds operated by one lever. It is a selective transmission, making it possible to go from first to fifth speed, without going through the intermediary shifts and permitting rapid get-away and quick pickup. In low the gear ratio is 8.3-1 while in fifth it is direct drive.

Lovejoy Output 144,650 Sets

ANDERSON, IND., Oct. 9—Production of Lovejoy shock absorbers amounted to 578,600 units or 144,650 sets of four, in September at the Dayton plant of the Delco-Remy Corp., according to C. E. Wilson, president and general manager.

Beefsteak and Bouts on N.S.P.A. Program

DETROIT, Oct. 6—One of the entertainment features of the National Standard Parts Association convention and show, Oct. 29—Nov. 2, will be a beefsteak dinner for which 1400 steaks will be broiled in 10 minutes at Cleveland Auditorium. Allendorf's, famous Cleveland caterers, will lay fire brick on the lawn at the auditorium in order to install specially built ovens for the occasion.

The beefsteak dinner will precede an intercity boxing show which will be held under supervision of Jack Kirk, sales manager of the World Bestos Company and well-known in Eastern amateur boxing circles.

Mr. Kirk has arranged bouts in practically all weights. The show promises unusual interest by reason of the fact that the boxers will come from and will represent many cities from which N.S.P.A. members at the show will have come.

Several of the boxers whom Kirk has billed, participated in the recent Olympic games at Amsterdam. Mr. Kirk, who will referee, has headed the boxing committee of the New York Athletic Club for years and he has refereed hundreds of bouts.

N.A.F.C. Meeting Nov. 21

NEW YORK, Oct. 9—The National Association of Finance Companies will hold its convention at the Hotel Roosevelt, Nov. 20-21. Among the speakers are George M. Graham, vice-president of Willys-Overland Co., and E. V. Rickenbacker, assistant sales manager of Cadillac Motor Car Co.

Power Conference Feb. 11

CHICAGO, Oct. 9—The fourth Midwest Power Engineering Conference will be held here Feb. 11 to 14 under the direction of W. L. Abbott, Chicago, president, and the other officers.

Coming Feature Issue of Chilton Class Journal Publications

Nov. 17—Production and Factory Equipment Issue—Automotive Industries.

Welding and Alloys Hold Interest at Metal Week

PHILADELPHIA, Oct. 13—Celebration of the Second National Metal Week closed here today. Conventions of the American Society for Steel Treating; the American Welding Society, and the Institute of Metal Division of the American Institute of Mining and Metallurgical Engineers and the National Metal Exposition were held.

Development of new cutting alloys which make possible cutting speeds unattainable on many modern machine tools, and new applications of welding equipment, featured both the technical sessions and the exhibits. Nearly 10,000 sq. ft. of space in the exhibit was devoted to welding displays and numerous new developments demonstrated the rapid progress which this branch of industry has made during the year.

Papers presented at the technical sessions of the three societies covered many aspects of metallurgy, many of particular automotive interest.

MacKenzie to Address Institute

NEW YORK, Oct. 8—American Iron & Steel Institute will hold its thirty-fourth general meeting at the Hotel Commodore, Oct. 26. Among papers of interest to the automotive industry will be "Steels Used by the Automotive Industry," by W. J. MacKenzie, vice-president Interstate Iron & Steel Co., Chicago, and "Steel Requirements of the Aircraft Industry," by H. J. French, senior metallurgist, Bureau of Standards.

16 Cars in Display at New York Salon

NEW YORK, Oct. 9—With an increased number of de luxe motor cars to be exhibited, the twenty-fourth annual Automobile Salon, to be held Dec. 2 to 8, will fill the main lobby and the entire ballroom floor of the Commodore Hotel. The salon will be repeated after the first of the new year at the Drake in Chicago, the Biltmore in Los Angeles and at the Palace in San Francisco.

The chassis to be exhibited at the New York salon include Cadillac, Chrysler "80," Cunningham, Duesenberg, Franklin, Isotta Fraschini, LaSalle, Lincoln, Mercedes, Minerva, Packard, Pierce-Arrow, Renault, Rolls-Royce, Stearns-Knight and Stutz. Special custom coachwork exhibits will be made by Brewster, Brunn, Castagna, Derham, Dietrich, Fisher, Fleetwood, Holbrook, Judkins, Le Baron, Locke, Murphy, Rollston, Weymann, and Willoughby.

N.A.P.A. Meeting Oct. 30

DETROIT, Oct. 8—National Automotive Parts Association will hold its annual convention here Oct. 30 to Nov. 1. The association points out that the overlapping of dates with the National Standard Parts Association meeting in Cleveland is due to a combination of circumstances which could not be avoided.

Advertising Meeting Nov. 2

NEW YORK, Oct. 9—Advertising managers of the members of the National Automobile Chamber of Commerce will meet in Cleveland Nov. 2. Edward S. Jordan, president of Jordan Motor Car Co., chairman of the advertising committee, will preside.

Campbell Opens Office

DETROIT, Oct. 9—The A. S. Campbell Co. has opened an office in the Fisher Building here where it will maintain a complete engineering service on clear vision construction.

Calendar of Coming Events

SHOWS

Aeronautical Exposition, Coliseum, Chicago .....Dec. 1-9
American Road Builders Association, Inc., Cleveland Auditorium..Jan. 14-18
Automotive Equipment Association, Coliseum, Chicago .....Oct. 22-27
Berlin .....Nov. 8-18
Boston, Mass., Mechanics Bldg...March 2-9
Brussels .....Dec. 8-19
Buenos Aires .....Nov. 29-Dec. 9
*Chicago, National, Coliseum, Jan. 26-Feb. 2
Montevideo .....Nov. 10-19
National Standard Parts Association, Cleveland Auditorium....Oct. 29-Nov. 2
*New York, National, Grand Central Palace .....Jan. 5-12
Paris, trucks .....Nov. 15-25
Salon, Automobile Salon, Inc., Hotel Drake, Chicago .....Jan. 26-Feb. 2
Salon, Automobile Salon, Inc., Hotel Biltmore, Los Angeles .....Feb. 9-16
Salon, Los Angeles Motor Car Dealers Association, Biltmore Hotel..Oct. 17-20
Salon, Automobile Salon, Inc., Hotel Commodore, New York .....Dec. 2-8
Salon, Automobile Salon, Inc., Palace Hotel, San Francisco...Feb. 23-Mar. 2
Western States Metal and Machinery Exposition, Los Angeles.....Jan. 14-18

*** Will have special shop equipment exhibit.**

CONVENTIONS

Annual Dinner—Overseas Club, Hotel Stevens, Chicago .....Oct. 24
American Road Builders Ass'n, Inc., Cleveland Auditorium .....Jan. 14-18
American Society for Steel Treating, Semi-Annual Meeting, Los Angeles .....Jan. 14-18
Automotive Equipment Association, Coliseum, Chicago .....Oct. 22-27
Chicago Power Exhibition and Conference, Coliseum, Chicago.....Feb. 12-16
International Air Conference, Washington ... .Dec. 12-14
Mid-West Motor Truck Transportation Congress, Indianapolis..Oct. 23-26
National Association of Finance Companies, Hotel Roosevelt, New York .....Nov. 20-21
National Automobile Dealers Association, Palmer House, Chicago..Jan. 28-29
National Metal Congress, Los Angeles .....Jan. 14-18
National Research Council, Washington .....Dec. 13-14
National Standard Parts Association, Hollenden Hotel, Cleveland, Oct. 29-Nov. 2
Society of Industrial Engineers, Rochester, N. Y.....Oct. 17-19

A. S. M. E.

Cincinnati, Oct. 22-25—Machine Shop Practice.

S. A. E.

National

Chicago, Dec. 6-7—Aeronautic.
Detroit, Book-Cadillac, Nov. 22-23—Production.
Detroit, Book-Cadillac, Jan. 15-18—Annual.
Detroit, Oct. 22—Detroit Body Division Meeting.
Newark, Robert Treat Hotel, Oct. 17-19—Transportation.
New York, Hotel Astor, Jan 10—Annual Dinner.
New York, Oct. 25—Metropolitan Section Meeting.